

AGC Contractors Ask Less  
Inspection Red Tape

page 45

December, 1961

# ***ROADS<sup>A N D</sup> STREETS***

A GILLETTE PUBLICATION



UNIVERSITY MICROFILMS  
EUGENE S. POWER  
313 N. 1ST ST.  
ANN ARBOR, MICH.  
COMP-LRV-11-50



**1. JACKSON VIBRATORY COMPACTOR.** On any major paving project involving the compaction of granular soils, from sand to large rock, or soil-cement mixes the JACKSON MULTIPLE VIBRATOR COMPACTOR will save its cost in jig time. It's faster in attaining 100% of specified density, more economical to operate and maintain, and has far greater job adaptability than any other machine. Each of the 6 compactor units delivers 4200 3-TON BLOWS PER MINUTE. The 4 outer units can be instantly raised for road travel or greater maneuverability around other equipment. Each compactor unit can be detached, fitted with operating handle and used as a self-propelling compactor to get into places other equipment can't reach. With side towing device no other equipment can rival it on widening operations.

**2. MUNICIPAL PAVING.** For jobs of this type a JACKSON VIBRATORY SCREED and Portable Power Plant is a very convenient, productive and inexpensive outfit. Strikes off to any crown, undercuts at curbs and sideforms, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 ft. wide. Rolls back for second passes on 4 rollers.

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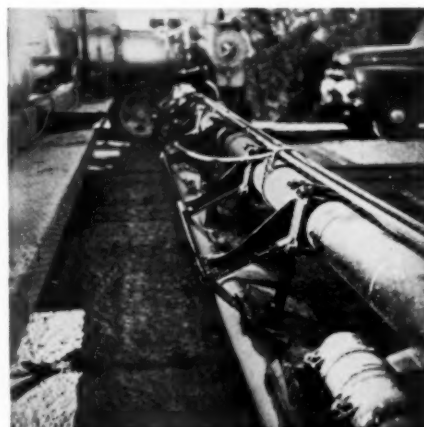
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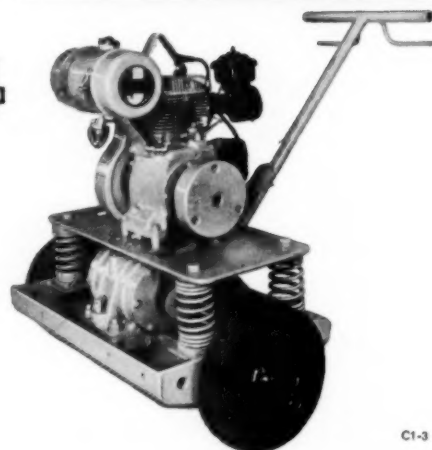
**JACKSON VIBRATORS, INC.**  
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3



4



C1-3



The "B" means we rolled it at our Bethlehem, Pa., plant.

For quick, positive identification  
of Bethlehem structural steel...

LOOK FOR THIS **BRAND**



for Strength  
... Economy  
... Versatility



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### FRONT COVER SCENE

The paving train of Koss Construction, one of the nation's leading contractors in concrete road yardage, is seen on I-70 east of Kansas City, Mo. A Koehring 34-E Tribatch and two Koehring 34-E Twinbatch pavers paced the work. The units placed about a mile of 24" x 10" slab per day on this 11-mile 4-lane job.

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# Get more work done . . .



***the "Euc" C-6  
tops them all  
for versatility!***

The easy operation, fast response and all-around work-ability of the Euclid C-6 make it the outstanding crawler in the 200 h.p. class. Proven Torqmatic Drive provides full power shift and instant reverse with no delay for clutching . . . with a flick of the wrist you change direction or speed range. Dependable GM 6-71 engine delivers 211 net h.p. to the power train . . . common steering-braking contributes to easy operation and exceptional maneuverability under all working conditions.

And there's nothing that comes close to the C-6 for service accessibility that cuts downtime and pays off in more work-ability. Unitized assembly of major components cuts repair and replacement labor costs to the absolute minimum . . . well below those for comparable tractors.

**EUCLID Division of General Motors**  
Cleveland 17, Ohio

*Plants at Cleveland and Hudson, Ohio  
and Lanarkshire, Scotland*

Get all the facts and figures on the C-6 . . . you'll find that low operating cost plus reliable performance on the toughest jobs make it your best tractor investment.

**DOZING and RIPPING . . . plenty of power, good stability and exceptional maneuverability make the C-6 a top performer in rough work and heavy material.**



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**FOR MOVING EARTH, ROCK, COAL AND ORE**

**Over 20,000 hrs. with no  
transmission trouble, repair...  
or even adjustment!**



With other tractor manufacturers beating the drums about "New," "Improved" no-shift transmissions, it is well to remember these facts:

- 1 - Every EIMCO Dozer and Loader built has **smooth single lever power shift, at no extra charge.**
- 2 - EIMCO'S patented, unique and job-proven "Unidrive" power-shift transmission is the **simplest, most fool-proof transmission built today.**
- 3 - "Unidrive" power-shift transmission, with gears that never reverse their direction of rotation, regardless of tractor direction or speed, has been **proven in the toughest work on the roughest jobs.**
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"Advanced Engineering and Quality Craftsmanship Since 1884"

B-633

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Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 69 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

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# YOU NEED THE WORKHORSE THAT STAYS ON THE JOB!

YOU CAN'T MAKE MONEY  
ON "DOWN TIME" ...

## A WORKHORSE AS A CRANE

GET acquainted with the 25-D the workhorse of the  $\frac{3}{4}$  yd. field. Here is a real package of versatility and dependability. It brings you everything you need! As a crane there is nothing more versatile in the  $\frac{3}{4}$  yd. class. Long, wide crawlers for stability! The improved Feather-Touch Clutch Control retains true "feel" of the load on the main drums. Northwest Uniform Pressure Swing Clutches run cool and smooth and eliminate jerks and grabs that set a boom to jumping.

Take a look at the Northwest Independent High Speed Worm Boom Hoist. It is built for heavy duty — power up and power down, independent of all other functions. There's a 3rd drum available for an extra load line and easier handling on pile driver work.

Many other advantages for crane work are available—sectional Boom Hoist rigging and Pendant Lines, Telescopic Boom Struts, Folding Gantries, Adjustable Jibs, Removable Counter Weight and a host of other features that assure greater value day-in and day-out on the job, whether it's working as a crane, dragline, pullshovel or shovel.

Here's a rig that will handle work that lighter machines of the same rated capacity can't handle. It will pay you to ask about it.

**NORTHWEST ENGINEERING COMPANY**  
1504 Field Bldg. • 135 South La Salle St. • Chicago 3, Illinois

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CRANES • SHOVELS • DRAGLINES  
PULLSHOVELS • TRUCK CRANES

3/4 to 3  
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## A WORKHORSE AS A PULLSHOVEL



## A WORKHORSE AS A SHOVEL



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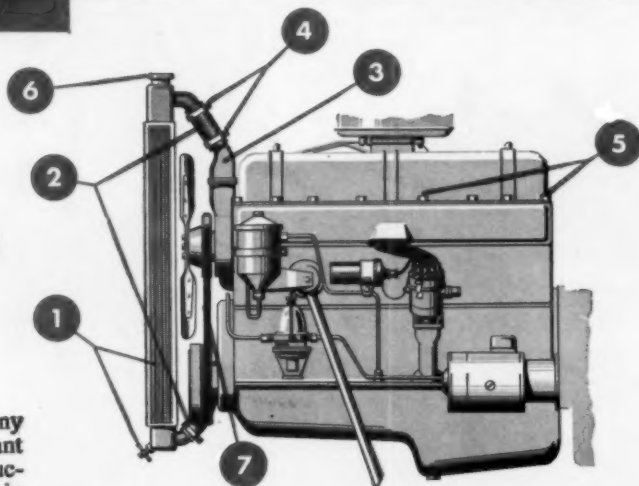
### Antifreeze: what's the best type to use; how to make sure you get maximum protection

It's getting pretty close to antifreeze weather in many parts of the country, which brings up two important points: choosing the best type of antifreeze for construction machinery; and making sure the cooling system is in good condition, so the antifreeze can do its job properly.

The right type of antifreeze is the permanent kind. Construction equipment engines operate best at 180°F jacket temperature which is ten degrees higher than the boil-off point for alcohol. Permanent antifreeze (like Texaco Startex) will stay on the job at the temperature that's best for the engine. *Don't* substitute salt or kerosene solutions. They won't freeze, true enough, but they're tough on engine components.

It's important to keep the cooling system in good shape for three reasons: first, because antifreeze that gets into the crankcase causes severe varnish deposits on pistons and rings; second, because you want the antifreeze solution to circulate properly; and third, because antifreeze lost through a leak costs a lot more to replace than just plain water. Before you add antifreeze, check the following points:

- 1 Clean the cooling system—drain and flush thoroughly.
- 2 Check the radiator hoses, replace any that are soggy or collapsed.



- 3 Check the thermostat. If the thermostat is in good condition, the thermostat discharge connection will remain closed until the coolant in the water jacket is up to operating temperature.
- 4 Tighten connections on hoses that don't need replacing. Antifreeze can pass through spaces too small for water leaks.
- 5 Tighten cylinder head, oil cooler and other hold-down bolts.
- 6 Check radiator filler cap gasket.
- 7 Inspect and adjust fan belt.
- 8 Now you're ready to put in the antifreeze.

**After the antifreeze is in, it's a good idea to:**

- 1 Check the level at operating temperature.
- 2 Check for leaks.
- 3 Check water pump packing nut adjustment.
- 4 Check cooling solution with suitable hydrometer to make sure of protection temperature.

### Metal concrete forms can be readied for re-use faster

You can get metal concrete forms cleaned up and back on the job faster if you spray them, before use, with Texaco Stazon. Use the Stazon just as it comes from the container for best results. Field reports say it gives the concrete a fine smooth finish, and the Stazon prevents sticking, shortens clean-up manhours.

### Magneto Lubrication: three *IF*s and a *BUT*

*IF* the magneto is oil-lubricated, apply a few drops of oil every 500 hours.

*IF* the magneto is grease lubricated, apply Texaco Marfak Multi Purpose 2 every 100 hours.

*IF* the magneto is located near the engine exhaust pipe, lubricate with Texaco High Temp Grease every 50 hours.

***BUT*** if the bearings on your magneto are *sealed*, follow manufacturer's recommendations and let the distributor do the servicing.



# efficient equipment performance



## Key points in choosing gear lubricant for gyratory crushers

One of the toughest lube jobs on a gear-driven gyratory crusher is the gears themselves. They're partly protected by oil-tight cases and dust rings, but some contamination is inevitable, and it's essential that you choose a lubricant that can take it.

Viscosity is very important. These gears are very heavily loaded, so too-low viscosity may not provide a film thick enough to prevent metal to metal contact. On the other hand, if the lubricant is too thick, it will hold grit and dust in suspension, and let it develop a scoring action on the gear teeth. In addition, dust tends to dry out lubricants, and also creates a "packing" condition between gear teeth. This packing of dust and dried lubricant can build up undue pressure on gears and bearings.

Your best bet is a lubricant with a viscosity between 50 and 160 seconds Saybolt Universal at 210°F, with extreme pressure characteristics. These specifications will get you a lubricant with a good compromise between too thick and too thin. Ask any Texaco Lubrication Engineer to help you pick the right grade for your temperature zone.

## TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in time and money can be made. If Lube Logic doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

ROADS AND STREETS, December, 1961

## TEXACO PRESENTS THREE NEW FILMS TO HELP BOOST YOUR PROFITS



**1. PLAN FOR PROFIT**—Texaco's newest color-and-sound movie. Dramatizes the major savings you can make with the proper investment of less than 1% of your total budget—the amount you spend on lubricants. Film features latest lubrication methods and equipment on a number of contracting projects, demonstrating the Texaco Simplified Lubrication Plan in action.



**2. FUNDAMENTALS OF LUBRICATION**—a brand new Texaco color slide film. A clear, concise once-over that defines technical terms like "viscosity" and explains specifically what lubrication is and what it does. This down-to-earth discussion will give the lubrication man a new understanding of the importance of lubrication, and a fresh interest in his work. It's supplemented with a manual that covers the same ground in greater detail.



**3. LUBRICATION OF EARTHMOVING EQUIPMENT**—a new slide film, in color. A concise, easy-to-understand analysis of proper lubrication of engines, wheel bearings, steering, track rollers, crawler treads, hydraulic equipment, wire rope, open and enclosed gears. Supplemented with a manual that covers the whole field of earthmoving equipment lubrication in greater detail.

**FOR AN EARLY SHOWING** of any one of these films—or all of them—contact your Texaco Contractor Representative now.

Tune In: Huntley-Brinkley Report, Monday Through Friday—NBC-TV

# TEXACO



Throughout the United States

Canada • Latin America • West Africa



# Steel reinforced

**for longer life in storm sewer service!**

Concrete pipe reinforced with strong **USS AMERICAN Welded Wire Fabric** solves drainage problems.

Albuquerque, like most southwestern cities, is spreading out. You see new construction almost everywhere you look. This photograph shows some of the activity that goes into transforming the wide open countryside into new residential areas. It was taken in the North East Heights development and shows the laying of reinforced concrete pipe for a storm sewer. In this project, approx. 17,000 lineal feet of reinforced concrete storm sewer pipe from 24" dia. through 72" dia. was laid.

The pipe shown is 72" pipe, and every foot of it was *steel-reinforced* with **USS AMERICAN Welded Wire Fabric** to give it the strength and durability to withstand heavy loads and assure long service life. It was pre-tested to meet the rigid requirements of ASTM Specifications C76-57T, and will withstand loads exceeding 100,000 lbs.

A large number of concrete pipe manufacturers are using **USS AMERICAN Welded Wire Fabric** to get greater strength and durability. This quality wire fabric is made on precision machines to the closest of tolerances  $\pm 0.003"$ —with center to center spacings held to  $\frac{1}{4}"$ . It is prefabricated from cold-drawn, 60,000 psi min. yield strength wire. All intersections are electrically welded to assure positive mechanical anchorage in the concrete. For more information about **USS AMERICAN Welded Wire Fabric**—write American Steel and Wire, Dept. 1456, Rockefeller Building, Cleveland 13, Ohio.

*USS and American are registered trademarks*

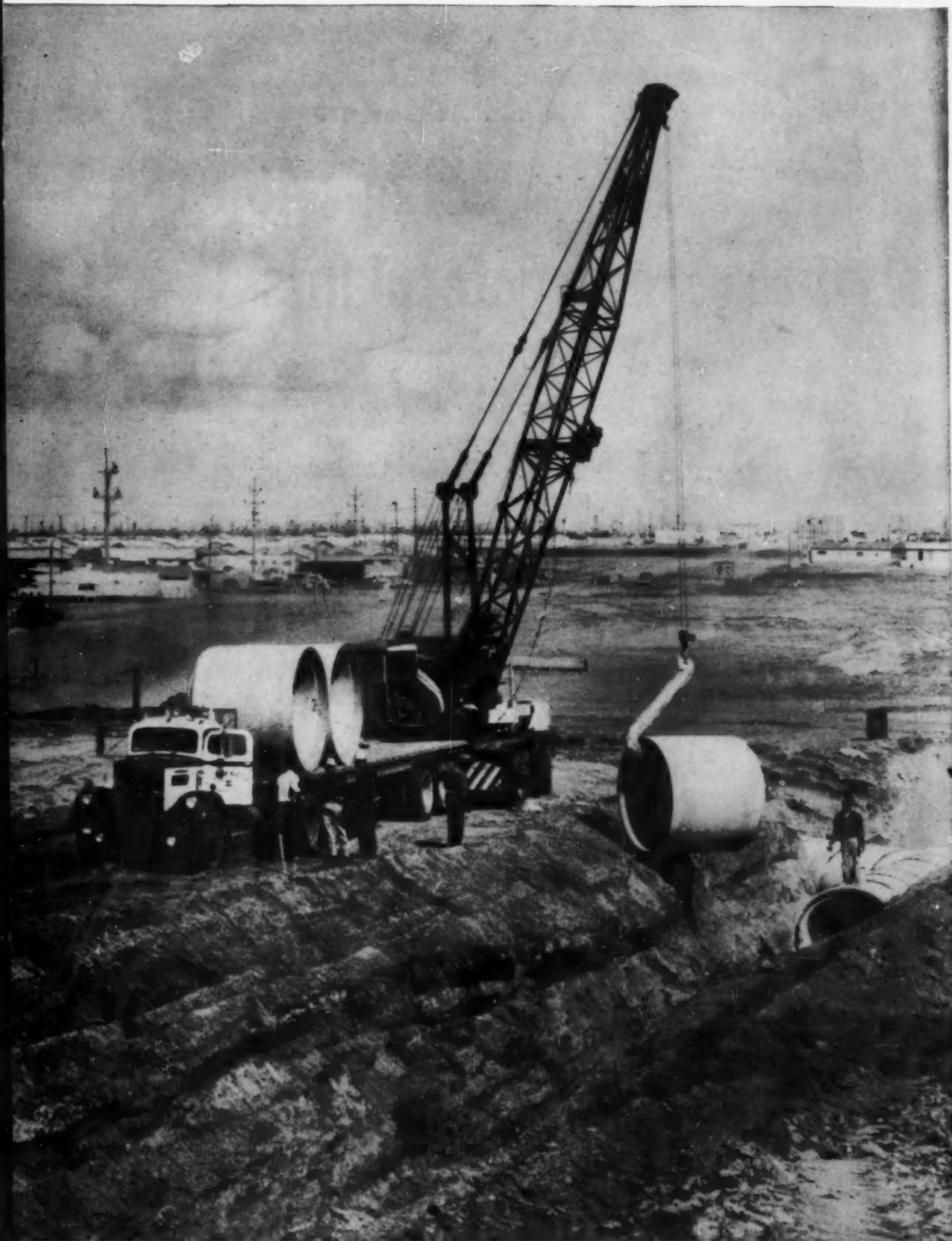


**American Steel and Wire  
Division of  
United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors  
Tennessee Co. & Iron Division, Fairfield, Alabama, Southern Distributors  
United States Steel Export Company, Distributors Abroad



**Project:** Storm Sewers, North East Heights, City of Albuquerque, N.M.  
**Engineers:** Gordon Herkenhoff & Associates. **Contractor:** C. R. Davis Contracting Company. **Product:** Reinforced Concrete Pipe ranging in size



from 24" to 72" dia. Reinforced with USS American Welded Wire Fabric.  
**Manufacturer:** Pipe by American-Marietta Corporation. Reinforcement by  
American Steel and Wire Division of United States Steel.

This mark tells you a product  
is made of modern, dependable Steel.





**Planet-Drive "25" advantages  
add up fast—"feeding" 400-ton-  
per-hour aggregate plants**





"400 tons of pit run gravel pushed into the conveyor daily—sometimes on pushes of 200—300 feet—is great production, and we are happy," states Ken Blattner, for D. H. Blattner & Sons, Albany, Minnesota. "The big TD-25 dozer gets its load faster, carries it along without wasting its power in steering—and it completes cycles faster and easier than we believed possible."



**You see first-hand what happens** when crawler "half-stopping" and load-dropping are eliminated—the first time you watch an International TD-25 round a curve under full load. You don't brake a track and half-kill your power to steer. "Dead-track drag" is eliminated—"live track" Planet Power-steering gives full-power momentum, full time.

Bank-cutting bladesful of gravel without nosing into the bank or sluing is another yardage-adding dividend of Planet Power steering. You equalize offset loading, keep full hp producing, with ease. Simply power-shift the "25's" load-side track to high speed range—leave the other track in low range—and take full bites where clutch-steered rigs only "nibble."

Use Planet Power steering to power-shift up on-the-go (wherever possible) or—power-shift down (wherever necessary)—to get maximum speed on every push. And you do it with a *standard equipment* feature. Hi-Lo power-shifting is another built-in bonus of the TD-25's planetary system!

With exclusive International DT-817 engine wallop, the "25" slugs along, 230 Turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes. No wonder single TD-25's, time and again, are feeding 400-ton-per-hr. aggregate plants!

**See how fast Planet-Drive "25" advantages** add up—in producing aggregates at minimum cost—as well as on heaviest bulldozing or push-loading. Prove what it means in production and profit to get TD-25 four-speed torque-converter efficiency range control. Let your International Construction Equipment Distributor demonstrate!



**International<sup>®</sup>  
Construction  
Equipment**

International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Ill.  
A COMPLETE POWER PACKAGE

Because the TD-25 can side-cut gravel without time waste and has "live track" steering to deliver full loads to the crusher, this plant is in the 400-ton-per-hour class. The job: W. Hodgman & Sons, Inc., Fairmont, Minnesota, producing gravel for an experimental stretch of soil cement base state road.

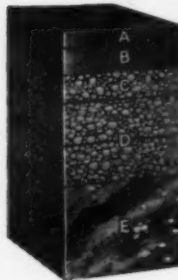
With blade built-up to six feet high, this TD-25 (at 7,800 ft. altitude) drifts huge loads of gravel into the batch plant—maintains production of 410 tons per hour with ease. Fast TD-25 reversing up the steepest grades speeds the shuttle-cycle, increases capacity. Owner: Northwestern Engineering Co., Denver, Colorado—working on an Interstate road contract east of Evanston, Wyoming.





For strength and durability, 7½ inches of Asphalt surface and base are laid on 17 inches of compacted aggregate.

**HERE IS DEEP STRENGTH DESIGN  
ON OHIO INTERSTATE 71**



- A.** 1½-inch Asphalt concrete surface course
- B.** 2¾-inch Asphalt concrete base course
- C.** 3-inch penetration Asphalt macadam base course
- D.** 2—4-inch water-bound macadam base courses
- E.** 9-inch selected gravel subbase



## New Section of Interstate 71:

# First DEEP STRENGTH Asphalt Paved Interstate Highway in Ohio!

Traffic is now rolling on the first DEEP STRENGTH Asphalt paved Interstate Highway in Ohio. Serving a highly industrialized area, this new 17-mile section of Interstate 71 will be subjected to heavy freight traffic.

That's one reason why Ohio State highway engineers chose DEEP STRENGTH Asphalt pavement. Notice in the cross-section drawing (below) how design follows precepts of DEEP STRENGTH Asphalt construction . . . heavy-duty Asphalt concrete surface course . . . heavy-duty Asphalt base . . . Asphalt primed subbase . . . **depressed median and deep longitudinal drain on outside and inside shoulders for good drainage** . . . heavy proof-rolling of subbase . . . and use of high-contact pressure pneumatic proof-roller on all other courses. **HERE IS STRENGTH AND DURABILITY!**

**When built like this—for DEEP STRENGTH—Asphalt pavements will carry heaviest traffic loads without distress . . . and with minimum maintenance cost.**

And, most important, Asphalt pavements built to this Advanced Design Criteria can often save money over the cost of Asphalt pavement designed to other standards. That's because the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

**NEW HANDBOOK!** A new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt pavement is now available. Write to The Asphalt Institute.

New DEEP STRENGTH Asphalt section extends northeast paralleling existing U. S. Route No. 42.



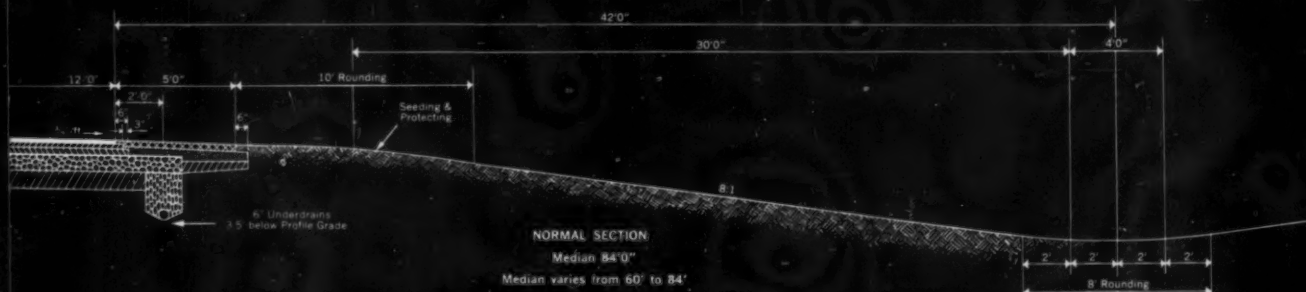
For smoother riding, the subbase was proof-rolled with a 50-ton compactor using tire pressures of 150 psi. A 30-ton rubber-tire compactor with tire pressures of 120 psi was used on all other courses.



For good drainage, section was designed with a depressed median and a system of deep longitudinal drains on each side of travel lanes to prevent water from entering the foundation courses.

## THE ASPHALT INSTITUTE

Asphalt Institute Building, College Park, Maryland



(PICTURED ARE THE SOUTH-BOUND DRIVING LANES. NORTH-BOUND DRIVING LANES CROSS-SECTION DESIGN IS IDENTICAL.)





## Galion 160 works hardest where workpower counts most

This husky 160-hp. grader makes full use of more than 30,000 pounds of well-balanced weight to put more "push-power" at the blade—where power counts most in high-output grading.

Its massive one-piece welded frame is built to take the shocks and stresses of hardest working conditions day after day—keeping maintenance costs low.

Standard Galion features—including full floating axles, hydraulic booster steering, heavy-duty constant-mesh transmission and a 12' x 29" moldboard—permit Model 160 operators to do more work each day.

... for more details circle 284 on enclosed return postal card

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*For complete information  
contact your Galion distributor  
or write for Bulletin 421.*

THE GALION IRON WORKS & MFG. COMPANY, GALION, OHIO, U.S.A.

General and Export Offices, Galion, Ohio, U.S.A.—Cable Address, GALIONIRON, Galion, Ohio

ROADS AND STREETS, December, 1961



## ROADS AND STREETS

Sixty-Eight years of Editorial Leadership

# Washington News Letter

By Duane L. Cronk, Director, Highway Information Services

December 10, 1961

The state highway officials have voted overwhelmingly for a position against the requiring of alternate bids for pavement and drainage types. Forty-nine states voted affirmatively to an AASHO ballot last month asking state legislators and national legislators to permit officials to determine such matters on the basis of "controlling engineering and economic considerations." The administrators have become disturbed over bills in Congress and action in state legislatures to require alternate bids for asphaltic and portland cement concrete pavements, particularly.

\* \* \*

Congressmen who have been disturbed by the highway scandals of recent months have introduced bills to put Uncle Sam squarely into the right-of-way acquisition picture. Senator Ben Smith of Massachusetts has two bills in the hopper with this in mind. One would enable the Department of Justice to represent the U.S. in property condemnation for proposed highways. The other would permit the Department to make independent appraisals of right-of-way and preliminary engineering costs. If it appears to the federal officials that the state-determined costs are on the high side, the federal agency could step in and handle matters itself.

A number of such bills, representing individual view points on one or another controversial highway matter, have been waiting in line for attention. They are bound to come up for consideration and for hearings soon after the new session convenes next month. Look for a lot of sound and fury from Congressmen who would like to "reform" the National Highway Program or streamline it in various ways.

\* \* \*

An expansion program for the Highway Research Board has been launched here with ambitious plans to raise \$225,000 more for administration and correlation of research around the country. The 52 AASHO highway departments have promised to produce another \$100,000 for this work, the BPR supplying \$25,000.

Highway industries, particularly those which turn out traffic control products and construction materials and equipment, are being invited to produce the balance by signing up for the Board's new membership category (Industrial Associate - \$1,000 a year). The importance of the Board's activities to these members of the highway fraternity is obvious in their attendance and participation in annual meetings. The Board's annual meetings have provided an excellent opportunity for manufacturers' research engineers to present results of their efforts and to set the stage for new or improved methods. Or, just as important to their competitive position, to learn what the research needs are, and what research projects are under way or wanted.

(continued on next page)

The new money will pay for a larger staff of experts and more publications in construction, maintenance, design, economics, and other areas.

The competitiveness of the highway contracting business came out again in figures released last month analyzing awards during the first half of 1961. Bureau of Public Roads statisticians found that roadbuilders bid 8.7% under engineers' estimates on \$1.3 billion worth of federal-aid work.

Only in Colorado and Hawaii did low bids run over engineers' estimates during the six months' period (4.9% and 1.3% respectively), but they dipped to lows of 20% under estimates in Alaska, Delaware, New York and North Dakota.

Contract sizes ran a wide range, as usual, from under \$25,000 to nearly \$13 million. About 42% were for below \$100,000, and 78% below \$500,000. More than 99% of the contracts let were within the range of participation by small business, the BPR spokesmen said.

\* \* \*

Likelihood of more airport improvement work will result from pressure the federal Aviation Agency is exerting for higher facility standards. FAA is now drafting such standards, which will undoubtedly promote construction of parallel runways where necessary, more high-speed turnoffs and taxi strips, and more modern lighting.

At least 14 of the country's largest fields are already over-loaded or near maximum capacity. And the increase in air travel will soon make several dozen other airports obsolete, unless new construction or improvement projects are put under way. The expenditure of \$2.8 billion for purchase of land and airport construction has been recommended by a Presidential task force surveying airport needs during the next ten years. The group recommended, also, that the principle of allocating federal aid geographically be abandoned for a method of distribution on the basis of need.

\* \* \*

The burst of public interest in fall-out shelters has led both local and federal officials to wonder aloud if such facilities might not be constructed under the protection of the new highways now under way or proposed. Engineers have already drawn plans for such a shelter under an approach ramp for a Seattle expressway. This particular one would protect 200 people. The federal government will equip and stock the \$75,000 structure as one of the several hundred prototype shelters it is financing under the new shelter program.

New statistics department . . . State highway user money for road construction, maintenance and administration rose to \$5.6 billion this year, the BPR reported last month, a 4% increase over the previous year . . . More than 11,250 miles of the Interstate System has been completed and opened to traffic. Construction is under way on another 4,800 miles . . . Nearly 87½ million Americans are now licensed to operate automobiles and trucks. California leads the pack with 8.7 million.

The cost of new highway construction dropped 2% or rose 1.1% during the third quarter, depending upon whether one uses the old 1925-29 statistical base or the newly adopted base using 1957-59 prices . . . Legislatures in five states boosted gasoline tax rates this year. One state adopted a resolution proposing a constitutional amendment to reserve highway money for highway purposes. Proposals to weaken such amendments were defeated in three other states . . . The BPR's new highway construction usage factors for cement, bitumens, concrete pipe and clay pipe are available on request to the Bureau of Public Roads, Washington 25, D.C.



*Farm-to-market road in Lamar County, Texas, was built in fall of 1957 with an original strength of 415 psi. Spring, 1960, core shown above tested 831 psi. Cement used was 8% by volume.*

## Pavement strength increases 100% in 2½ years on this road in Lamar County, Texas

**...soil-cement pavement grows stronger year by year!**

**Core tests give dramatic proof that soil-cement grows stronger with age. In fact, it's the strongest low-cost paving material there is.**

Examples from all over America give evidence of the low-cost service provided by soil-cement pavements. To begin with, 75% of the materials are usually free. Soil, old gravel roads, or broken-up blacktop,

can be the main ingredients. Mix with portland cement and water, roll solid, let harden—then top with a thin bituminous surface.

Paving goes fast. Experienced crews using modern machines can lay up to one mile a day. And this is one low-cost pavement that keeps maintenance costs at the barest minimum. It has the beam strength that distributes traffic loads over

the subgrade—stays level, free from ruts and washboarding.

It's easy to see why soil-cement is being specified more and more wherever low-cost pavements are needed for roads, streets, airports and parking lots. Write for free complete information. (U.S. and Canada only.)

### **PORTLAND CEMENT ASSOCIATION**

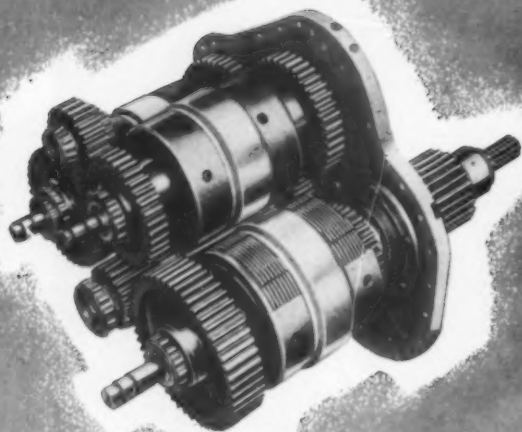
Dept. A12-28, 33 W. Grand Ave., Chicago 10, Illinois

*A national organization to improve and extend the uses of portland cement and concrete*





# this new power-shift transmission



**NOW YOU CAN CHOOSE** your LeTourneau-Westinghouse B Tournapull® with either Fuller step-gear transmission (with LW High and Low Range) . . . or all-new LW-designed-and-built POWERFLOW 700 transmission. It's a constant-mesh, countershaft-type unit with full power-shift and torque converter . . . extremely simple, reliable, proven in over two years of testing.

## No "shift-shock"

Because double-acting clutches in the "700" cannot engage simultaneously, you'll never have gear "overlap" or "underlap", therefore never be troubled with "shift-shock". Wet-disc range clutches engage hydraulically by means of manually-operated rotary valves.

## Cooler running

Pressurized "mist"-type lubrication reduces amount of oil within the case, therefore minimizes heat-load common to splash or cover lubrication. All transmission oil is filtered and cooled, with throw-away filters.

## 8:1 ratio and QUIET

The 8:1 ratio spread of the "700" is the widest in the industry. You will find it exceptionally quiet, too, because ground spur gears, mounted next to bearings on large-diameter shafts, are used throughout.

## Rear-mounted for accessibility

You won't often have to work on this transmission, but when you do, you will find it easy. It's rear-mounted, for fast, "walk-up" accessibility and removal.

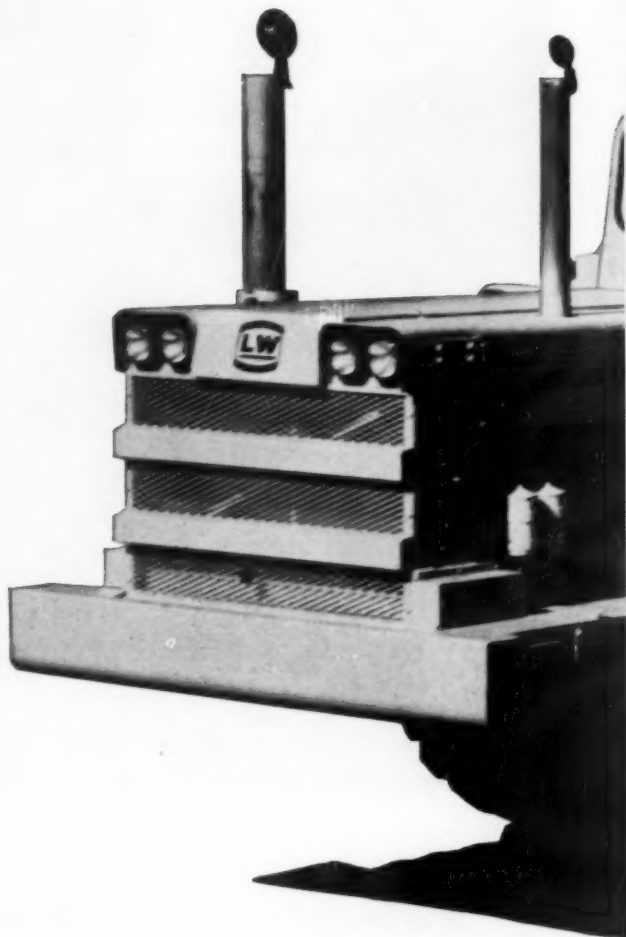
## Automatic lock-up

For dollar-saving "straight-drive" operation at higher speeds, the "700" features automatic lock-up. An extra: the lock-up clutch also engages automatically when hydraulic brake is applied, so that engine-braking power is added to that of the hydraulic brake.

## Gear-coupled torque converter

For easy installation and removal, the "B's" torque converter is gear-coupled. It offers integral sump design, plus Full-Flow filtration of all converter fluid. It has a stationary stator, to eliminate "over-riding clutch".

# NOW OFFERED



**...plus these other**

**6,000 lbs more payload capacity;  
5,000 lbs less "deadweight"**

Capacity of the "B" is now 25 cu yd struck, 32 cu yds heaped, and 37 tons. That's 3 tons more than previous models. Yet, because the yoke, apron, and structural members of the Fullpak® scraper are now made of lightweight high-tensile-strength steel, the "B" weighs almost 5,000 lbs less than before! With its GM 12V-71 diesel producing 430 hp at 2100 rpm, you enjoy the snap and power of the *best* power/weight ratio of any scraper of this type and size.

Your LW Distributor has the complete story of these B 'Pull improvements. He can show you how they can work for you . . . for lowest-net-cost-per-yard. See him now.



## IN TODAY'S BIG YARDAGE B 'PULL'



### **new production-boosters:**

#### *Dry type air cleaners*

Most effective air induction system available! Two-stage filtration provides long element life, and first-stage element *cleans itself*.

#### *Single-motor control of apron, bowl-hoist*

One motor and a new cable-control unit now operate both your apron and bowl-hoist. This reduces generator loads, reduces service and parts requirements.

#### *Feather-touch lever controls*

Your operator now controls scraper work-motions with three "fast-grasp" knobbed levers that move forward and back swiftly, with "feather touch" instant "feel-of-load" response.

You will find many *more* improvements in the B Tournapull. A new tailgate design that speeds loading. New "straight-up" scraper side-sheets that make it impossible for rocks to lodge between sides and scraper arms. New safety latches with automatic "cut out". More than a dozen "maintenance speeders".

\*Trademark BP-2486-DC-2



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A Subsidiary of Westinghouse Air Brake Company

*Where quality is a habit*

# Seven years of field experience prove it! **YOU CAN MAKE**



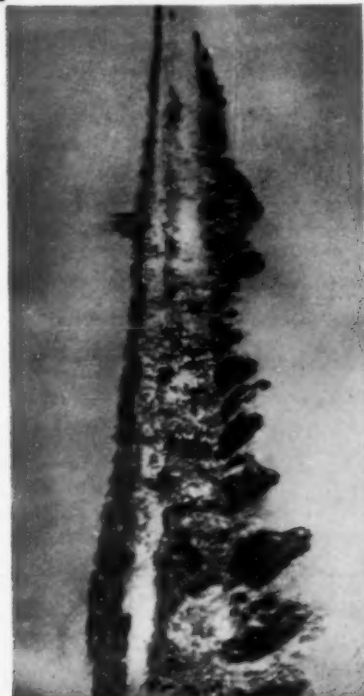
**BROKEN ABUTMENTS:** Restored stronger than new by brushing on polysulfide-epoxy adhesive to rejoin old concrete, or to bond fresh concrete to old.

**FASTENING TRAFFIC MARKERS.** Fixed to road surface with polysulfide epoxy adhesive alone, lane strips have stayed rigidly in place for long periods of time.



**FILLING RUTS AND DIPS.** Adhesive and aggregate mixed in ratio of 1 to 5 is spread and troweled right over depressed area. No digging down to roadbed or exposing steel reinforcements.

**SPALLED JOINTS:** Repaired in two hours by using polysulfide-epoxy mixed with aggregate as trowelable compound. Reduces tie-up time as much as 48 hours.



# LITTLE OF BIG REPAIRS



## ...with concrete adhesive based on THIOKOL liquid polysulfide polymer

Two chemicals in combination, THIOKOL liquid polysulfide polymer and epoxy resin, are providing one of the most useful engineering tools of our time.

Together, they produce a brushable, quick-cure adhesive used to join old or fresh concrete to old...to bond skid-proofing materials to roadways...to seal and protect surfaces against chemical attack and water seepage. The resultant bond is stronger than concrete itself, waterproof, acid resistant, and flexible enough to withstand repeated freeze-thaw cycles.

Repairs which heretofore required days of labor and road downtime, the use of heavy equipment and large crews of men are now being completed at a fraction of the cost in time, manpower, material and dollars. Serviceability of such repairs is, by actual experience, proving more satisfactory than those achieved by conventional methods.

Want to know more about this new engineering material? How it's used? Where it's used? The benefits and economies that accrue? Write to Thiokol for brochure CA-200.



**POT HOLES:** Repaired to featheredge and ready for traffic in as little as three hours when patched with mortar mix of polysulfide-epoxy, sand or aggregate.



**HAIRLINE CRACKS:** Filled with polysulfide-epoxy. Adhesive film sprayed or brushed over surface seals out water, checks further deterioration.

**SCALED AREAS:** Repaired in only a few hours with adhesive containing THIOKOL liquid polysulfide polymer. Bonds new concrete to old. Watertight bond stronger than concrete itself.



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**ROADS AND STREETS, December, 1961**

## Thiokol®

**CHEMICAL CORPORATION**

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In Canada: Naugatuck Chemicals Division,  
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CA-200 dealing with concrete adhesives  
applications and methods.

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RS

# **"Our 48 Ford Trucks have given maximum economy in every way!"**

*says Fred Newkirk, Manager of Materials Transportation Company, Inc., Corpus Christi, Texas*

"We are using Ford Trucks exclusively because they provide important savings—starting with a lower initial expenditure. We estimate that each Ford costs us about \$1,500 less than other makes of comparable size and capacity. Our maintenance and repair costs are less, too. The greater parts interchangeability on Ford Trucks makes it possible to reduce our parts inventory by about 50%; this frees \$2,500 of working capital. And in operating expenses, we save on gasoline because our Fords deliver an extra  $\frac{1}{2}$  mile per gallon.

"They have proven more durable, too. For example, our 1958 Ford F-1000 has logged over

160,000 miles without even having the heads or pan off. We expect 200,000 miles from these Super Duties before a major overhaul. Some of our 1955 and 1956 Ford F-900's still have their original brake linings after 300,000 miles.

"Our trucks operate six days a week, and the average fleet mileage is 51,000 miles per week. We haul 48,000-lb. payloads of bulk cement or 37,760-lb. payloads of sack cement for Halliburton Portland Cement Company. Our drivers are also very enthusiastic about these new Ford Super Duties. They report that with 72,000-lb. grosses Fords are smooth riding and easy to handle."

**Solid testimony that Ford's full-time economy only starts with low price!**

## **FORD TRUCKS COST LESS**



PRODUCTS OF  MOTOR COMPANY





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**ROADS AND STREETS, December, 1961**

# NEED FAST DELIVERY on FINE CASTINGS



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(WE HAVE 15,000 PATTERNS READY)

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## People

### Terzaghi and Ferris Voted Moles' Awards

Dr. Karl Terzaghi, of Winchester, Mass., internationally known pioneer in soils mechanics, and George F. Ferris, board chairman of Raymond International, were named by The Moles as 1962 award recipients for "outstanding achievements in construction." This association of leading figures in the tunneling, dam-building and heavy construction industry will present the honors at their annual Awards dinner, January 31, at the Waldorf-Astoria Hotel in New York City.

The award is made annually to one member and one non-member. Dr. Terzaghi is the non-member winner. Eugene G. Rau is Award Committee chairman.



Dr. Karl Terzaghi

### Lyman Heads Precast Concrete Institute

R. J. Lyman, chief engineer, Atlas Structural Concrete, Inc., of El Paso, Texas, is the 1962 president of the Prestressed Concrete Institute. Lyman succeeds Jacob O. Whitlock, of Midwest Prestressed Concrete Co., Springfield, Illinois.

Other officers elected at the Institute's recent Denver convention were: (Vice President) Robert A. Matthews, Precast Industries, Inc., Kalamazoo, Mich.; and (Secretary-Treasurer) Elmer Clark, United Materials, Inc., Phoenix.

### Alaska's Road Problems Are Different

The problems of road building in Alaska were explained to the construction committee during the Western Association of State Highway Officials conference held earlier this year at Las Vegas. John A. Fairly, Jr., construction engineer for the Alaska Division of Highways told fellow committeemen that their problems "come wrapped in a different package and present a different appearance than in other places."

Drainage is complicated because of the great climatic range and the constantly wet soil. In addition, much of the ground is permanently frozen. Permafrost requires hand clearing in many low lying areas so as not to disturb the insulation blanket. When a cut has to be made in the frozen soils, "we usually are in trouble," noted Fairly.

River ice three to four feet thick requires special bridge piers which may cost as much as \$750,000 each.

Fairly also listed points in favor of road construction in the 49th state. In Alaska there are still, "good old fashioned country jobs where a contractor can work without any interference from traffic." And, in many parts during the summer, the contractor can work on a 24-hour operation without floodlights.

Alaska's methods for combating "glaciering" on state highways was explained by another representative, A. G. Gardner, assistant state highway engineer for the Alaska division. Addressing WASHO's maintenance committee he said that actually five general methods now are used to combat the conditions north of the 60th parallel. These are draining, establishing freezing belts, installing surface barriers, widening cuts, and giving up the road altogether and relocating it.

The method most commonly used, called the "ice fence," is an improved version of the surface barrier, was first developed by Russians. This method consists of installing a slat-type snow fence parallel to the highway. The fence eventually will form into a wall of ice keeping water from the highway.

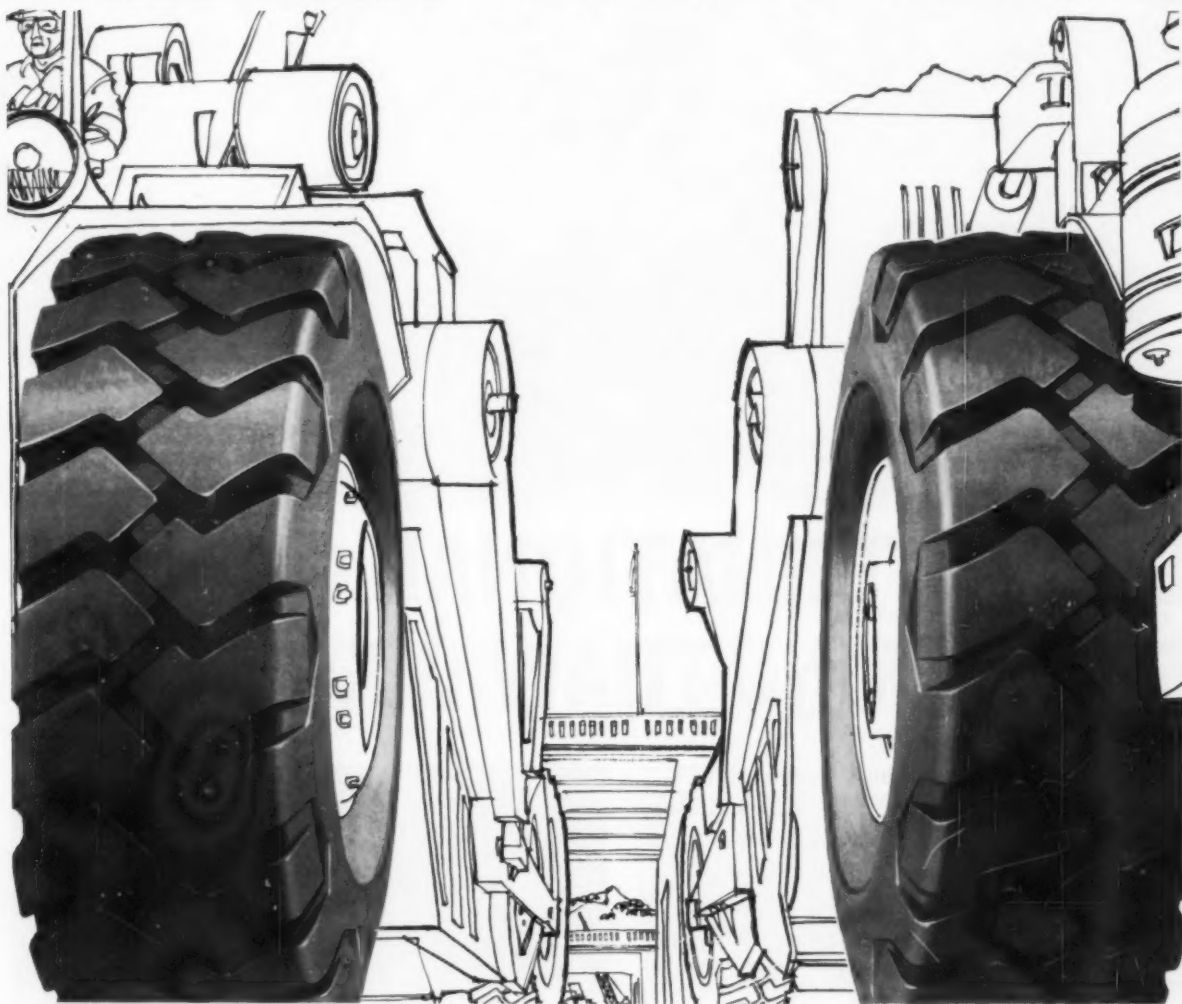
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**WHEN SO MUCH DEPENDS ON YOUR TIRES . . .**

# COUNT ON FIRESTONE TO BEAT TOUGH SCHEDULES!

Construction job records prove that the built-in stamina of Firestone Super Rock Grip Wide Base giant tires cuts down-time, keeps equipment rolling on schedule. With the super strength of Firestone Rubber-X and Shock-Fortified nylon cord bodies, they take the most punishing blows from rocks, stumps, snags—and roll right on to get the job *done*.

Always on call, too, is a Firestone Tire specialist to help you solve *any* tire trouble (he can often spot potential problems before they arise!). To multiply production and profits with this *Firestone team*—Giant Tires plus Giant Tire Service—simply call your Firestone Dealer or Store.



# Firestone

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**Always Specify Firestone Tires When Ordering New Equipment**

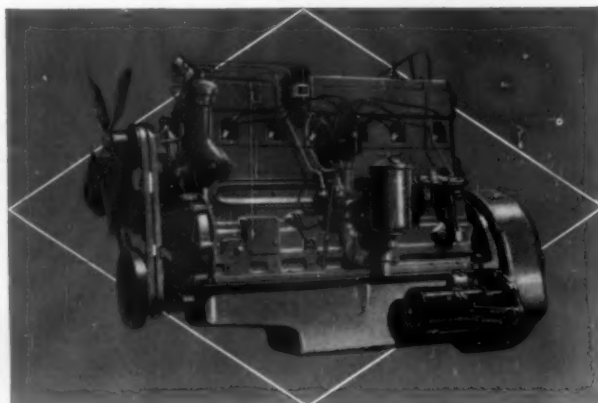
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# LET INTERNATIONAL GET YOU FOR SPRING-THAW CONTRACTS

Select from 4 famous INTERNATIONAL Red Diamond engines—there's one right for any construction project

One of the main reasons for INTERNATIONAL truck leadership is right under the hood. The 6-cyl., valve-in-head, high-torque design of these famous engines offers you the perfect power-range for every operation. Available in 372, 406, 450 and 501 cu. in. displacements. (Royal Red Diamond 501 shown here). See your INTERNATIONAL Dealer or Branch now and be sure of early delivery.







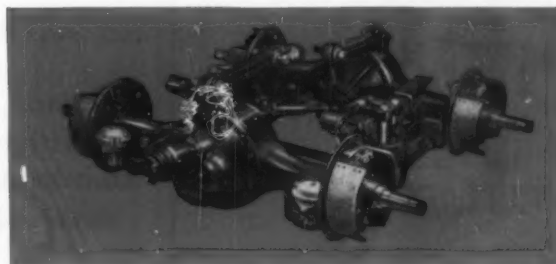
# READY RIGHT NOW!

**Put INTERNATIONAL designed-and-built tandem axles on your job — warranted for 100,000 miles**


Gives you greater torque and load capacities—more savings in weight—less truck wear and tear! Induction-hardened axle shafts with up to 10 times more resistance to shock loads. Lightweight unit with simplified power divider and through-drive design. Shafts and other parts interchangeable between axles. Three models—in ratings of 30,000, 34,000 and 38,000 lb. capacities. International Harvester Co., Chicago, Ill.

## How to get the jump on early Spring operations:

Combine the proven power of an INTERNATIONAL Red Diamond engine with the sure traction of a rugged INTERNATIONAL tandem axle and you can stop worrying about unpredictable Spring weather. For example, they call the rugged Model RF-190, shown here, practically bog-down-proof. The broad INTERNATIONAL line of 6-wheelers is available with gasoline, diesel or LPG engines to 262 hp. GVW's from 22,000 to 73,000 lbs.



# INTERNATIONAL® TRUCKS

WORLD'S MOST  
COMPLETE LINE 

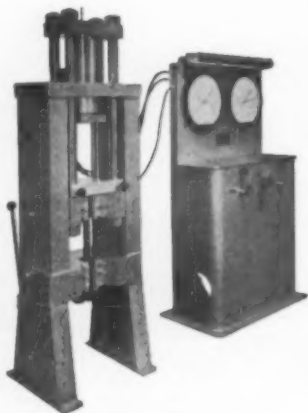
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## **FORNEY CONCRETE TESTERS**

**KNOWN THE WORLD OVER**

### **MODEL LT-800 UNIVERSAL TESTER**

Designed especially for the  
Construction Materials Laboratory



Capacity 0 — 250,000 lbs.

Standard Equipment Includes:

- Gripper Blocks for Nos. 2 through 11 Reinforcing Bars
- Upper and Lower Platens for 6" x 12" Cylinders
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Extra Apparatus for Testing:

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Model LT-800 is only one of a complete line of lowcost, top quality machines made and guaranteed by . . .

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## **New Publications**

### **1960 ASTM "Proceedings"**

A 1242-pg. volume, in which is recorded the technical accomplishments, including reports and papers, together with discussions which were offered to the American Society for Testing and Materials (ASTM) during 1960, is now available.

This official record of the proceedings also contains the summary of ASTM's 63rd annual meeting, and the annual report of the board of directors. 77 reports of technical committees, with supplementary appendices, and 44 technical papers on subjects pertaining to research and standards for materials are included, along with lists of all symposia and other special sessions of the society.

Copies of "Proceedings" may be obtained from the American Society for Testing and Materials, 1916 Race St., Philadelphia 3, Pa., at \$12.00. To members, \$8.00.

### **Merits and Costs of Dust Control Agents**

Water can be the most expensive dust control agent on a highway construction job. This was one finding of tests conducted by the California State Division of Highways to determine the relative merits and costs of a variety of products used in controlling dust.

The findings have been published in Bulletin 280, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Price \$0.60.

### **Six-Place Trig, Logarithm And Antilog Tables**

All the tables listed in the above title, plus logarithms of trigonometric tables are included in a handy (2 $\frac{3}{8}$  x 5 $\frac{3}{8}$  in.) volume Vest Pocket Library Book series. Price \$1.00. Available at book, stationery, and department stores.

Or inquire at Ottenheimer Publishers, Inc., 4805 Nelson Avenue, Baltimore 15, Maryland.

Beside the tables, there are many pages of formulas, interpolation, and valuable information.

**INFLUENCE OF STABILIZERS ON PROPERTIES OF SOILS AND SOIL-AGGREGATE MIXTURES.** Bulletin 282, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Price \$3.40.

This 160-page publication contains eleven papers presented at the Board's 39th annual meeting in January, 1960. Additives covered variously include phosphoric acid, sodium chloride, lignosulphates, bituminous materials, calcium chloride, and other materials.

**KEY TO SMOLEY'S:** 1960, G. F. Wolters, P.O. Box 475, Ormond Beach, Fla., 80 pages, plus diagrams, Price \$1.50.

The book was compiled to aid and simplify in the full understanding of Smoley's Tables. The book gives graphic examples and solutions and their respective application to the tables, which are: Parallel Tables of Logarithms and Squares; Logarithmic Trigonometric Tables; Parallel Tables of Slopes and Rises; Segmental Functions.

**PUBLIC WORKS MANUAL—PART I, STANDARD DETAILS.** Published for staff use by Metropolitan Dade County, 3240 N. W. 27th Avenue, Miami 42, Florida, F.D.R. Park, Chief Engineer. First of three parts; Part II (Design and Construction), and Part III (Standard Specifications) in preparation.

**INCOME AND SALARY SURVEY OF PROFESSIONAL ENGINEERS:** National Society of Professional Engineers, 2029 K Street, N.E., Washington, D.C. Data compiled from a survey of 24,000 names.

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***There's a type and size  
just right for your job!***

Whatever your off-highway hauling work may be—heavy construction, mine, quarry and industrial jobs—there's a job proved "Euc" that can cut your costs and step up production. With unmatched field experience and parts and service facilities of a world wide dealer organization, Euclid Rear-Dumps meet today's requirements for big performance on the toughest jobs.

For facts and figures proof that "Eucs" can mean lower costs on your work and are your best investment, call the Euclid dealer that serves your area.

**EUCLID** Division of General Motors, Cleveland 17, Ohio  
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FOR MOVING EARTH, ROCK, COAL AND ORE

**R-10** <sup>10</sup> TONS

**R-15** <sup>15</sup> TONS

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**PLUS**

**12, 22 and  
35-TON**

**Semi-Trailer  
Rear-Dumps**



# COMMENT

## from the BUTLER ENGINEER

### ... of Obsolete Ocean Liners as Central Mixed Plants

They're constructing caissons for a Chesapeake Bay job with a BUTLER Ready Mixed Plant. The Chesapeake project served-up an unusual difficulty to furrow the contractor's brow. Waves. Waves that leap as much as 18 feet high. A barge-mounted plant was too risky. So the contractor bought an old, obsolete ocean-going boat. He mounted the BUTLER Plant amidships. Aggregate stock piles? In the hold. Works beautifully and the aggregate provides excellent ballast to modify pitch and roll.

It's no idle wharf gossip that the Queen Mary will soon be supplanted, so when you've got yourself a big water job—buy her. Just mount a BUTLER Plant aft of the captain's bridge. Incidentally, the first class lounge would make wonderful offices. We're told that the men on the Chesapeake job never ask for shore-leave on weekends. Seems Chesapeake Bay is lousy with mermaids.

We recently mentioned a remarkable (remarkable, hell—astounding!) BUTLER Central Mixed Plant for pouring into the forms via agitator trucks, on paving jobs. The first location was a highway project near O'Hare field in northern Illinois. No pavers. No crews. Enormous savings. Eliminates traffic congestion at the grade. And it travels on its own wheels at 45 m.p.h., or if preferred it can be shipped "piggy back" on flat cars. Unloaded it travels on its own wheels to the job site. Takes about a day to erect. We have a Bulletin ready. Send for it.

Me? I love my job!

*The Butler Engineer*

BUTLER BIN COMPANY  
WAUKESHA, WISCONSIN

# LETTERS

## To The Editor:

Since your magazine "Roads and Streets" has a very wide distribution and practically reaches the entire construction industry, I am a little concerned about the editorial which you have written in the September issue, (Highway Morality Can't Be Left to the States"). If I read it correctly, you are saying that we need more government control in order to more effectively handle highway construction. Certainly there have been problems in the industry in which state officials as well as contractors have been involved.

I am certainly not minimizing the scandals which have been investigated and there should be some concern; however, I am of the opinion that legislation is not the answer. As more government control is exercised, we lose our rights and privileges as representatives of business, and I am sure in our free economic system that we are not in need of additional government regimentation.

Marvin F. Borgelt  
Bituminous Surface  
Treating Company,  
Minneapolis, Minn.

Mr. Borgelt: This editorial was carefully worded *not* to suggest more government control of the state highway departments. It said that the departments must basically continue to run their own shows. The Blatnik-committee-type action is an independent investigative one. The fact remains that this outside

action has uncovered wrongdoings, borderline ethics and shoddy construction in state governmental situations that seem to have existed in some cases chronically until thus exposed. Editor.

## To the Editor:

I have read with much interest and appreciation various articles on the aspect of mixing in quality control of bituminous mixtures. Your publication, I believe, has published reviews on the subject.

The dry mixing time is something to which I have given considerable thought and experimenting. It is my firm conclusion that the proper name for it would be Dry Separating Time, as that is exactly what is accomplished. Stop the mixer after a dry run of a few seconds and you will find the material well separated, the coarse on top and the 200 on bottom.

One way I found to help in getting the materials well distributed throughout the mass or batch is to weigh them into the hopper in reverse of the usual order—coarse first, then the other sizes—then begin the spray as soon as the material starts into the pugmill. This lets the fines come in last, and hence they will be well distributed throughout the mass. The coarse material will be well coated and there will be no "balls" of fines and asphalt.

C. E. Edge  
Hardin Construction Co., Inc.,  
Glencoe, Alabama

## Tip to Make Wire Rope Last Longer

A suggestion from one of the owners of LeTourneau-Westinghouse equipment is passed along to *Roads and Streets* readers, on the use of wire rope.

According to this machine owner, the trick is to periodically cut one foot from the end of each piece of cable used to operate construction equipment. Once a week, perhaps.

The reason is that on every hoisting job there is a spot where the

rope is continually bent over a sheave, where the load is greatest. This section of rope wears the fastest, and will be the first to weaken. Often this is in the middle of the cable, resulting in a costly waste of rope.

By periodically pulling through a foot or so of cable, and cutting off excess, the wear spots will be relocated. Wear will then be distributed throughout the cable length. This trick has been used effectively on LeTourneau-Westinghouse Model D rear dumps, as described by the operator.





STANDARD RM 6,000 pound asphalt plant.

## "exceeding our fondest hopes"

After a thorough analysis of competitive plants, Wells Cargo selected a STANDARD RM 6,000 pound asphalt plant. Production from this STANDARD RM plant has consistently exceeded 275 tons per hour under the most rigorous operating conditions.

STANDARD RM asphalt plants are available in capacities of 2,000 to 8,000 pounds.

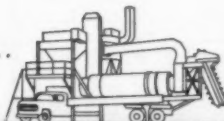
Let us tell you more about *America's No. 1 Line of Asphalt Plants*. Write us...or contact your STANDARD Distributor.



STANDARD RM 2000 to 8000 pound. Semi-portable and Stationary.



STANDARD TM 1000, 1500, 2000 and 3000 pound. Completely portable... "push-button" self-erecting



STANDARD SE 4000, 5000 and 6000 pound. Portable... "push-button" self-erecting



This new 60-ton tractor is so different there is  
**nothing like it**  
in design, or in performance on  
push-loading and dozing work

For two years on several multi-million-yard earth-moving jobs a new idea in push-loading has been under extensive and sustained operation behind a variety of scrapers. This new idea is the HOUGH D-500 PAYDOZER — a different and better kind of rubber-tired pusher and dozer as shown by its performance on these projects.

**More Power.** A 700 hp turbo-charged V-12 Cummins diesel is governed to 2100 rpm and 600 hp for longer life and lower maintenance. Two newly-developed, high-efficiency dry-type air cleaners plus filtration of all oil circuits are provided.

**Articulated Hydraulic Steering** is one of the most unusual features and gives exceptional maneuverability. The turning radius is under 25-ft.—considerably less than its overall length and one-third less than a comparable unit with rear-steer. The rear wheels always track the front ones and always follow in the path cut. Combined with 30° rear-axle oscillation, this articulated steering keeps "all four feet" on the ground and also permits a twisting "walk-out" action in poor footing.

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THE FRANK G. HOUGH CO.  
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ROADS AND STREETS, December, 1961



# PAYDOZER®





**PAYLOADER®**



Before you buy any tractor-shovel in the 2 to 3 cu. yd. class consider the

# availability

designed into this new Model H-70C

You can't make money when your equipment is idle. "Down-time" is more costly in terms of lost production or yardage than it is in repair and parts costs. Machine availability—time on the job—is therefore one of the most important considerations when selecting any piece of equipment.

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**Less Maintenance Required:** The simplicity of PAYLOADER design, plus the special attention given to protecting points of normal wear, cut "down-time" and maintenance costs tremendously. The simplified boom mechanism has as many as ten fewer pivot and grease points than other tractor-shovels, which means fewer parts to service and maintain.

A single bucket-control cylinder cuts in half the number of cylinders, piping, hoses, linkages and wear points found on all other tractor-shovels. In addition, pivot points on boom, bucket mechanism and steering are fitted with "O" rings and other seals that keep dirt out and grease in.

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The cylindrical-vessel-type oil reservoir is outside-mounted and has a full-diameter cover that is easily removed for complete inspection and servicing of its two full-flow micronic filters.

Only a PAYLOADER gives you simplicity of design, the built-in protective features, the ease of accessibility that means more hours on the job, and also more yardage per hour. Only the model H-70C gives you a tractor-shovel with all these PAYLOADER advantages, plus more horsepower per pound, more dumping clearance and more reach than the average of all tractor-shovels in its class. Your HOUGH Distributor will be glad to tell you more about it and show you what it can do.



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## Traffic Safety

### Flasher on Station Wagon Helps Resident Engineers

Controlling traffic through construction and maintenance work is a more important problem each year, in the belief of Colorado state highway department staffers. Success in this control hinges a great deal on commanding the motorist's attention and respect.

Often in the news are instances of motorists running down flagmen and workers; and colliding with, or at least interfering with working equipment. Warning signs and barricades often are largely ineffective.

People however seem to retain a respect for flashing lights and uniforms, according to Jasper Croonenberghs, a resident engineer for the Colorado department of highways. Croonenberghs who works mostly in metropolitan Denver finally got his fill of dodging cars and not being able to easily park his Ford Ranch Wagon close to his work. He

didn't wear a uniform and no one paid much attention to his official license plates or the signing on the car.

So, he reasoned, local ordinance permitting, why not try a flasher on his car roof, such as is used by emergency vehicles. His solution was an FB-1 Fire Ball, a small rotating light manufactured by Federal Sign and Signal Corp. The light operates on car-battery voltage. It has a strong magnet in the base which firmly holds it in place when set on the top of his car.

Croonenberghs keeps this unit in his car except when it is needed. When the situation calls for its use he simply plugs a connection into the cigarette lighter and sets the unit up on the roof.

### Freeway Motorist Help Is Research Subject

To aid stranded motorists on the sometimes desolate expressways, researchers in the Ohio department of highways have devised a standby roadside communications system, through which a motorist can contact the state highway patrol for help. When a signal is received on the motorist-in-distress circuit, a warning light will flash in the nearest state garage. Present plans call for communications posts to be placed at one-half mile intervals along highways.

This development is one of the results of a one-year \$60,000 research program for the Ohio department of highways by the Ohio State University's Engineering Experiment Station.

An acknowledgement circuit will enable personnel monitoring the network to let the motorist know his message has been received; a recorder will eliminate the possibility of a distress call being overlooked.



A flashing signal atop the resident engineer's project station wagon has helped resident engineer Croonenberghs mingle safely with traffic along state highway work in the Denver metropolitan area.



*Now, the strongest bridges are the fastest to build because they're . . .*



## GUARDED BY GALVANIZED STEEL

Galvanized steel sheeting—long used for permanent concrete forms in building construction—has now been adapted to do the same job for bridge engineers and with remarkable success.

On bridges and their approaches, a heavier gauge sheet is used with deepened corrugations for added strength. This new form assembly is not only strong enough to support heavy concrete slabs, but installation takes only half the time required by other types of form work.

The strength and excellent corrosion resistance of galvanized

steel is also winning increasing acceptance in a wide variety of architectural uses as well as in other areas of highway construction, such as culverts and guard rails.

**WEIRKOTE® IN PARTICULAR** is one galvanized steel that's especially well suited to all these applications. Made by the modern continuous process, it can be worked to the very limits of its steel base without losing even a chip of its zinc protection. Weirkote is made by two National Steel divisions: Weirton Steel and Midwest Steel. For further details, write to Weirton Steel Company, Weirton, West Virginia.



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ROADS AND STREETS, December, 1961

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**NOTHING DIGS TRENCH LIKE A TRENCHER**

**EFFICIENT  
TOUGH  
PRODUCTIVE and**

**ACCURATE**

No other type of excavating machine digs trench with such precision as the modern, full-crawler-mounted, wheel-type trencher — the trencher originated and perfected by The Cleveland Trencher Company.

Look again at that picture. This Cleveland is digging in the middle of a sidewalk in a commercial area, working within inches of plate glass windows, hydrants, poles, etc. No other excavator approaches the accuracy of a trencher in conditions like this.

No other excavator digs to such accuracy of line, width and grade — no deeper or wider than necessary. This precision saves costly cubic yards of sand, gravel or

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The continuous-type trencher leaves straight, clean, vertical-wall trench ready for immediate installation of pipe, tile or conduit, or pouring of concrete for building footings. It produces trench of all kinds, for all types of end uses — produces it better, faster and at lower cost.

Investigate now the profit potential of a modern trencher — a fast, dependable, accurate Cleveland Trencher.



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### Contractors Make Serious Accusations

**T**he angry contractors who spoke up at the Associated General Contractors of America meeting at New Orleans made accusations that are indeed serious. If these are true, the over-zealous inspection, slow test procedures and dragged-out final payments in the highway program are doing more than just beat hundreds of contractors out of profits. These practices are leading toward an unwarranted cost rise in the road program.

The new ground rules for quality control now under fire were imposed on contractors in the midst of a big work-load. Most of their jobs were bid from estimates based on "B.C." cost patterns (before Blatnik Committee and resulting BPR memos to the states).

One might say that the contractors, by letting a small minority of their brethren get out of hand, brought this situation on themselves. Be that as it may, it's no excuse for the degree of over-control, red tape and lack of job cooperation now charged by

the contractors. Some observers tend to charge this attitude to the human tendency of contractors to exaggerate when talking about their hard luck. But the New Orleans outburst represented too many reputable industry leaders to be ignored.

Assuming that the grounds are only half as serious as charged, and that some states are handling quality control more fairly than others, the situation is still an unhealthy one. The charges need to be answered or else a "selling" job done among contractors.

By now the New Orleans message certainly has been heard in Washington and the states. It will be interesting to see what happens next; some of the troubles, since they stem allegedly from lack of qualified field personnel and from poor attitudes, can be corrected in some highway departments only by a major management overhaul.

Whatever the outcome, the contractors and the engineers need to get back on better speaking terms. It will cost the public heavily if they don't.

### Mickle's Appointment a Significant One

It is indeed appropriate that D. Grant Mickle was chosen to fill the new post of Deputy Federal Highway Administrator in Washington. Mickle is known as one of the most capable and dedicated men in highway work. He is articulate. He is among other things a *traffic* engineer and man with strong urban experience, where policy questions are flying thickest.

Mickle comes from the Automotive Safety Foundation, where as head of its traffic engineering division he directed traffic surveys and studies in numerous states. Previously he was with the city of Detroit and the Michigan state highway department.

A past-president of the Institute of Traffic Engineers, Mickle is one of the leaders in and out of ITE who have sought to develop as generalists rather than narrow specialists in traffic engineering—men who can not only signalize an intersection properly but who can function as broad planners of highway transportation.

Mickle's appointment signals the growing urban and traffic emphasis. And it should help maintain and strengthen the solid technical underpinning so essential in the administration of the federal highway program.

By Harold J. McKeever



One behind another, three 840 Deere tractors with Hancock self-loading scrapers drive through the culvert excavation, loading 7.5 cu. yd. in two minutes or less without pushers. Normally, a backhoe and a string of dumps would have been used, tying up at least one lane of the adjacent highway.

# Smaller Tractors And Scrapers Share Glory On Canyon Job

**A** concrete box culvert and other work in a California canyon freeway project have served as the demonstration ground for the versatility of smaller scrapers and bulldozers. For example:

(1) Normally the box culvert excavation job would have been handled by a backhoe, a string of dump trucks and a small dozer to feed the hoe. But Guy F. Atkinson Company's crew was doing it with three self-loading 7.5 cu. yd. scrapers—quicker, cheaper and with less traffic congestion along the parallel existing highway.

(2) Elsewhere in this 13-mile Sepulveda Pass segment of the San Diego Freeway, a small 35 hp (9 ft. long, 4 ft. high) dozer was backfilling in the cramped quarters between bridge columns and an encroaching embankment.

(3) A mile further along, a slightly larger bulldozer (40 hp, 6,700 lb.) was dozing fill sand from the top of a finished section of the 12 ft. wide culvert, then spreading the sand in the 7 ft. wide cut between the embankment and the culvert.

(4) At the far end of the job another small 35-hp gasoline powered dozer, with 4-ft. height, was spreading fill dirt beneath the low stretched cables tying together the retaining walls for a temporary fill at a railroad crossing. A huge bulldozer working fill to the beginning of the overcrossing dwarfed the smaller counterpart and its operator.

Smaller supplementary units have made a permanent place for themselves on the equipment list at this job involving the world's biggest highway cut. They have similarly won a warm place in the hearts of the men who supervise and operate the equipment.

"Our biggest complaint with these compact rigs," summed up one Atkinson foreman, "is that they appeared five years late. We have more jobs for them than for any other piece of equipment on the project."

Back to the box culvert and the 7½-yd. scrapers. The 800 ft. long excavation for the culvert was to be 13 ft. wide and 17 ft. deep. That's about 6,500 cu yd. It was for an extension of the giant culvert (see *Roads and Streets*, March, 1961) which runs under the relocated Sepulveda Boulevard and the San Diego Freeway.



The water truck couldn't make it, but with the aid of the little dozer, it moved in close enough to spray the fill.



Diesel-powered 440 Deere dozer working in tight confines between bridge pilings has been in operation 95 percent of the time on the Atkinson job.



Low-strung cables between the retaining walls places a premium on small, powerful equipment. This gasoline-powered dozer handled a job that would otherwise be done by hand.



Job: Backfill the narrow cut beside a box culvert on the San Diego Freeway. Solution: (1) Have rear dumps, which can't get into the cut, dump on the box culvert. (2) Use a vest-pocket bulldozer first to clean off the culvert, then spread the fill alongside.

Along one side of the culvert ran the jammed Sepulveda Boulevard. On the other side, a narrow strip permitting one-way equipment haul.

Originally the plan was to take out the 6,500 cu. yd. of material with a backhoe, route the loaded trucks along Sepulveda Boulevard to the fill area a half mile up the road, then bring the empties back along the haul road on the other side of the excavation. The backhoe and loading trucks would tie up one lane of the 4-lane highway. A smaller dozer would work in the bottom of the excavation feeding the backhoe. A grader would be used for finish trim.

Through previous experience with the Deer-Hancock 7½-yd. self-loading "piggyback" scraper-tractor combination, Atkinson's managers turned three of them plus a grader loose on the excavation job. The entire 6,500 cu. yd. of removal was done in less than four days without tying up traffic, without resorting to dump trucks and with significantly less manpower.

The whole story however wasn't just the speed. The job had to be done carefully, sloughing had to be controlled and finish grade had to be accurate. Here is how one foreman explained the solution to these problems.

"The scrapers were small enough to get into this cut. And the self-loading elevator meant that there wouldn't be any powerful gouging, or any of the congestion involved if pushers were needed in the close quarters. We simply run these scrapers in one behind the other. They load themselves at 3 to 4 mph and run out the far end."

How easily do they load and cut, with only 75 hp? "Their cutting ability is equal to the best high-powered scraper," remarked the foreman. "The loading elevator keeps the dirt back from the cutting edge and that's the whole story. This means the

operator can work with precision and with surprisingly little power."

Later on a job, these same units will be used for finish grade work—precise filling and trimming in those scores of tight areas where big equipment can't operate efficiently. Again from past experience, Atkinson's men were confident that the combination of self-loading and power dumping would let them work to within 0.05 ft. with consistency.

As on previous freeway projects, the scraper has proved good at moving windrowed base material and doing clean-up on shoulders and ramps.

And, "this little rascal," observed one excavation foreman, pointing to the 35 hp diesel dozer backfilling among the bridge columns, "has been on the job 95 percent of the time. The only time we're not working it is when we can't get an operator—and that's mighty seldom."

The small size and moderate power combine to popularize the Deere 440 gasoline, 440 diesel and 1010 diesel bulldozers here discussed. The 1010 was the one which shoved fill sand from atop the concrete culvert. A larger dozer would have overstressed the culvert and had difficulty spinning around.

Working in the tight confines of the railroad overcrossing fill—cables were strung 6 ft. above finish grade and the fill itself was scarcely 20 ft. wide between the retaining walls—the only alternative would have been to do the job by hand. As it was, the little gasoline dozer took up where the big rigs left off, cutting into the piles of fill dirt and working it back between the retaining walls, then boosting the water truck part way up the grade so the fill could be sprayed. It wasn't handling big yardage, couldn't push huge loads, but it was getting into those tight spots.



## AGC Action At New Orleans:

# 'Restore Inspection Sanity, We'll Clean Our Own House'

**T**wo developments in many respects overshadowed others at the Associated General Contractors of America's midyear board meeting, held October 23-25 at New Orleans.

1. The AGC leadership voted to re-avow its historic purpose of fostering "Skill-Integrity-Responsibility." The association's code of ethics will get new teeth. Action will be taken against the small percentage of member contractors who have tarnished the industry's reputation. And these decisions will be announced as a forthright act of public relations.

This, in answer to the recent scandals that have broken out in highway, school and other public construction.

2. At another session, the association's top highway echelon resolved to counter-attack at the state level against what is believed to be unrealistic job controls. The new procedures are hitting innumerable contractors in the pocketbook and threatening an "unnecessary cost rise in the highway program." A carefully worded resolution referred to unrealistic inspection, late, over-zealous or unfair testing, slow verdicts on field tests, and stretched-out final payments. These practices were said to stem from state highway engineers who are "running scared." The practices which are hurting contractors were defensively adopted following the Blatnik-inspired quality control revisions imposed since early 1960 by the Bureau of Public Roads.

The new rules and interpretations, the delegates claimed, are cutting profits on jobs that were bid under earlier conditions when job cost histories were lower. The delegates further emphasized that the present ground rules, if allowed to continue, will inevitably result in rising highway costs, over, and above inflation—a development which will force an embarrassed AASHO leadership and the state highway departments to go back to Congress for more funds to complete the Interstate system by 1972.

The three-day meeting of AGC's governing and advisory board, along with chapter managers and

various committees, also focussed on other matters than concern highway contractors. For example: training programs for operator apprentices, latest on the status of truck owner-operators, prequalification problems, the question of a combined performance and payment bond, how to combat force-account practices in counties and cities, and the need for stronger engineer-contractor joint cooperative committees at the state level.

The 600 delegates were also brought up-to-date on the overall accomplishments of the AGC, which is one of the nation's top ranking business associations with 127 chapters and about 7,300 members representing a great majority of the contract construction put in place today.

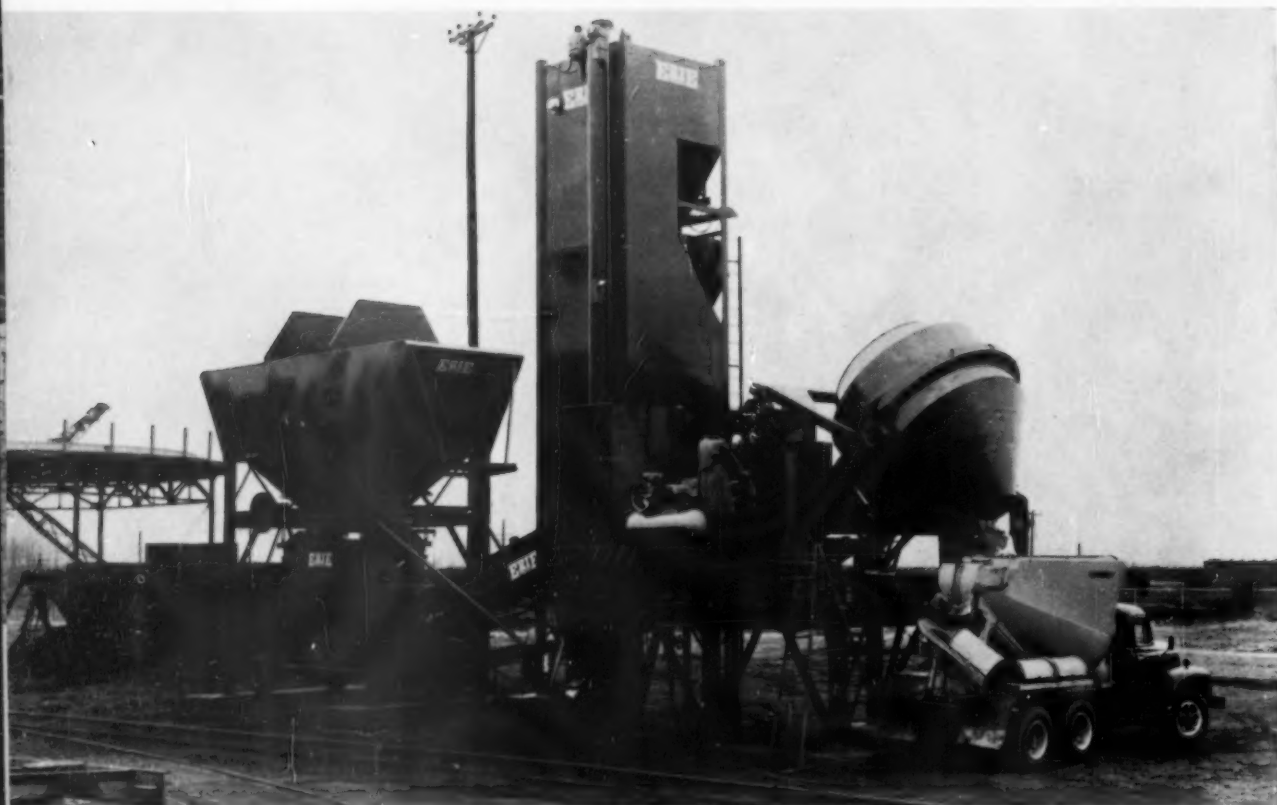
This review is confined to highlighting of the action to restore the industry's integrity reputation, and of the long and often angry airing given to the new, troublesome job controls.

### A Beloved Past-President Speaks out

Roads and Streets readers may recall the open letter which AGC's president M. Clare Miller sent to the membership during the past summer. This letter called for courageous self-analysis and facing-up by individual contractors as to their conformance with the AGC Code of Ethics. In furtherance of this unprecedented recognition of a serious public relations problem by the association's national leadership, the AGC Executive Committee decided to seek decisive corrective internal action while at New Orleans.

This action wasn't long in coming. At the opening general session, a challenge to action was presented by an association "senior citizen" uniquely qualified to speak with eloquence and be heard with respect. William A. Klinger, of a Sioux City Iowa firm bearing his name, who was AGC's president in 1936, laid the ground-work by reviewing the association's early beginning. AGC got its start in 1918 when 97

*Continued on page 66*



Mobile plants are latest innovation, with each section transported on its own permanent wheels. Aggregate batching plant (left) travels over-the-road in two sections. Cement silo and batching unit (tower in center) tipped on end at erection site. Mixer (right) rests on special low-boy trailer with power equipment and controls at either end. On raised platform, mixer discharges directly into agitator truck for transportation of finished concrete.



"Packaged" or "unitized" plant sections, such as this complete cement storage bin and automatic batcher, offer easy handling. This batching plant, part of a mobile central mix plant, is mounted on permanent running gear for convenient over-the-road transfer from one site to another.



**For Contractors:**

## **Latest Concepts In Concrete Batching And Mixing Plants**

**By J. A. Auld**  
Chief Consulting Engineer  
Erie Strayer Company

**M**any new concepts in concrete batching and mixing equipment have been introduced in the last few years. Indeed, the last six months have marked some of the most revolutionary changes in equipment the industry has yet seen; these point the way toward higher production, more uniform mixtures, and lower labor costs per yard of concrete produced.

Some of the trends worth watching are the increased mobility of high-capacity batching and central mix concrete plants, simplified, more accurate batch controls, more reliable conveyor systems; completely unitized plant sections; new methods for slump determination; and provision for "add-on" accessories. All of these can mean more competitive and more profitable operations for the contractor.

### **Increased Equipment Mobility**

In general, there is a tendency toward making all types of batching and central mix equipment faster and easier to erect and dismantle, with resultant savings in time and labor. There are three basic classifications of batching and mixing plants—permanent, portable, and mobile. Ordinarily, contractors use only the latter two, since the plant often must be moved to a new location for each project.

Permanent plants, sometimes called "knocked-down" plants, are the largest—both in holding capacity and in production output—and take the longest time to set up, in comparison with other types of plants. Some of these are as big as an eight-story building, with holding capacities in excess of 1,000 tons of aggregate and 3,700 barrels of cement. They are offered in welded panels as large as permissible by conventional shipping and handling methods. Panels are match-marked to facilitate field erection. In the past, weeks have sometimes been spent in the

field assembly or relocation of this type of plant on dam and other projects. Such plants have recently undergone redesign.

Portable plants are operationally similar to the permanent type, but are usually smaller in holding capacities. The main difference between the two is that while knocked-down plants are shipped as disassembled panels for field bolting, portable plants are factory assembled in convenient welded sections to reduce erection time. As an example, an aggregate bin—completely assembled—would be shipped with its supporting legs removed. At the work location, the legs are joined by a hinged connection and lifted as a unit onto the plant foundation with a single crane hook-up.

Mobile batching and complete central mix plants represent the latest innovation for high production paving operation, and offer the fastest set-up—at little as four hours after arriving at the work site. Each piece of equipment—cement silo, auxiliary storage silo, aggregate bin with conveyor, and separate mixer—is mounted on its own running gear so that it can be towed to the work location by a standard truck tractor. Due to highway limitations, some mobile equipment is of considerably smaller holding capacity than portable or permanent plants.

Mobile aggregate bins, for instance, may range from 28 to 100 yards holding capacity, which keeps them low-to-the-ground for easy bin changing and avoids high erection lifts. However, this is not a reflection on their production output. In recent months, a full-sized (7½ cu. yd.) mixer has been mobilized in a package compact enough to meet standard highway regulations. In use, it can produce as much as 230 cu. yd. of low-lump concrete per hour in one-minute mixing cycles.

The manufacturer who pioneered this advancement has mounted the mixer in the center of a



Typical permanent, or "knocked down" plant has large holding capacity and production output, but also takes longest to erect.



Portable plant features bucket elevator (next to cement storage silo) and belt conveyor (background) for charging storage hoppers. Shipped in prefabricated sections, quickly joined together at plant site.

special low-boy trailer, with controls and power devices at either end. When the trailer is towed into position at the project site, it is hoisted onto its own supports. This, plus a special lifting-and-tilting lever arm mechanism for the mixer, permits the trailer "package" to have a road height of only 13' 6", yet discharge directly into trucks standing more than 10 ft. high.

Mobile plants cost more initially than portable plants of equal production rating since axles, wheels, and sometimes transfer conveyors are employed. However, the savings in erection and dismantling expense more than justify the added base price for maximum mobility if several moves are likely throughout the life of the equipment. Highway contractors were the first to use completely mobile batching and central mix plants. Now, building contractors are joining the swing to the plants-on-wheels.

#### Unitized Plant Sections

More plant sections and components are being "packaged" for easier handling between projects and during plant set-up.

Mobile plants are the ultimate in unitized equipment currently available. But in portable and permanent plants, too, the trend is toward fewer separate components. Batchers are usually shipped complete with gates and operating mechanisms. Electric motors, drives, hydraulic and pneumatic power units, and other auxiliary equipment are permanently mounted on their respective plant sections for faster set-up without bothersome adjustment and alignment problems. The entire "building block" approach is rewarding, in lower shipping and erection costs, and also in easier maintenance and greater overall system reliability.

Bin sections are generally becoming smaller, because of the inherently more reliable charging conveyor systems. Formerly, it was necessary to specify equipment with sufficient holding capacity to deliver several hours of material to the batching system as "insurance" in case the feed conveyor lost power or became inoperative. This additional holding capacity permitted production to continue while the malfunction was remedied. Now, dependable conveying devices make this reserve volume nonessential.

The actual size of the sections, however, depends on a number of factors—the hourly and daily production rate, the amount of storage necessary, access to a source of materials supply, and availability of land on which to erect the plant. On large urban building projects where space is at a premium, the tendency has been to build large bins that eliminate space-consuming material storage piles.

In suburban and rural locations, where the valuation of real estate is lower and its availability higher, materials are generally placed on the ground near a conveyor or crane to transfer it to the storage hoppers and bins which need be only of sufficient size to keep pace with the batching output.

In addition to fewer plant sections, the smaller unitized plants offer such portability that they can be set up right at a work location, and even be moved along with the work in the case of highway



projects. This lends itself to cutting down on the number of pieces of associated equipment required. For instance, a plant at a project site can reduce the rolling stock by half or more, since fewer trucks on frequent short runs can keep up with production, and non-productive transit time is kept to a minimum.

#### Batch Controls

More accurate automatic batch controls are coming to the fore as a result of precise slump and strength specifications at highest production rates. Manual batching systems, with the accuracy of the weighing operation being dependent upon the operator's visual observation of the scale, are acceptable on lower production projects where concrete quality is not of highest importance. In such a system, the gates or valves may be operated by hand or by pneumatic, hydraulic, or electrical power assists.

In addition to the automatic operation of gates and valves, system interlocking is becoming more prevalent. A batching system which is *completely interlocked* does not permit the batching of any ingredient to begin until all batchers have been cleared of the preceding batch, and the scales returned to zero. It also prevents the discharge of any ingredient until the weighing of all ingredients has been completed. If the batching system employs interlocking of one or more batchers, but lacks any of the features of complete interlocking, it is called *partially interlocked*.

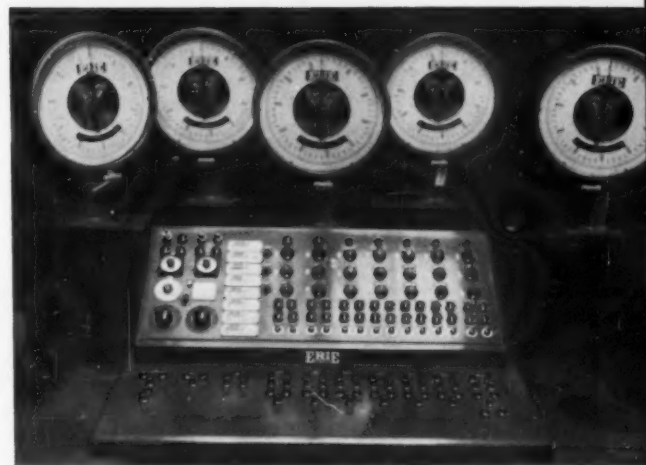
Either individual scales or cumulative weighing devices may be specified, depending upon the production required, and other factors. If different kinds of aggregates or different kinds of cements are weighed cumulatively in a single batcher, interlocked sequential controls should be provided.

"Automatic" batching systems are of four types. They are described this way by The Concrete Plant Manufacturers Bureau, an affiliate of the National Ready Mixed Concrete Association:

1. A partially automatic batching system consists of the required combination of batchers, at least one of which—other than the water batcher—shall be a standard semi-automatic or automatic batcher. A *semi-automatic batcher* is equipped with gates or valves which are separately opened manually to allow the material to be weighed, but which are closed automatically when the designated weight of each material has been reached. An *automatic batcher* is equipped with gates or valves which, when actuated by a single starter switch, will open automatically at the start of the weighing operation of each material and close automatically when the designated weight of each material has been reached. The degree of interlocking in a partially automatic batching system is optional.

2. A semi-automatic batching system consists of the required combination of standard semi-automatic batchers, or of standard semi-automatic and automatic batchers. The system may be completely or partially interlocked.

3. An automatic batching system consists of the required combination of standard automatic batchers.



Precise slump and strength specifications, at highest production rates, call for sophisticated batch controls and weighing equipment, as illustrated by this complex, fully electronic console.

All batchers in the system are actuated by a single starting mechanism; the system is completely interlocked.

4. An automatic batching system with mix selection consists of an automatic batching system, with additional equipment to permit the selection of a minimum of three pre-set mixes, each by the movement of not more than two switches or other devices.

The more automatic the batching system, the more uniform the mix—since it is made virtually "people-proof." This, then, permits highest production rates while accurately meeting precise specifications for material content of the mix, while measurably reducing labor costs.

#### Conveyor Systems

Some type of conveyor system (belt or bucket elevator) is generally used to charge aggregate storage bins of large plants. Belt conveyors, too, are employed to transfer aggregate batches from the batcher to the mixer charging hopper on mobile plants; large portable and stationary plants do not require this conveyor, since the materials literally drop into the charging hopper. A mobile plant capacity can be increased to that of a larger portable plant by increasing the size and speed of the conveyor belt.

On semi-permanent plant installations where trouble-free performance outweighs the slightly higher initial cost, belt conveyors are being used extensively. Although the installation cost is more than that of a crane or an aggregate elevator, a belt conveyor is the least expensive to operate and can be completely automated to save labor costs.

A crane, unlike a belt conveyor, can be used in many jobs, such as helping erect the plant itself. Although it occupies more space than an aggregate elevator, it takes less room but is more costly than a comparably rated belt conveyor. It may be added that front-end loaders are also being used to charge aggregate bins on mobile plants.

*Continued on page 68*

# NEW METHODS, NEW MACHINES PUT SECTIONS OF INTERSTATE



# 40% AHEAD OF SCHEDULE...

## Tandem loading with new power shift D9G speeds job for Greer Bros. & Young

The job is a big one: 5,000,000 yards to be moved on two adjoining sections of Interstate 75, just out of Jellico, Tenn. Terrain: hilly. Haul distance: 1600 feet. Soil: mostly clay and shale, with considerable ripping required. Time schedule: 300 days.

The London, Ky., firm has teamed new machines with new methods to meet the challenge. For example, the use of tandem pushers has resulted in 21 bank-yards (on adverse grades) in .6 to .8 of a minute. In this case, a new 385 HP Cat D9G Tractor was used in tandem with a D8H to load out new Cat 631 Tractor Scrapers.

"Tandem loading production has been boosted 25% with this D9G, as compared with an older torque converter D9," reports W. C. Howard, chief engineer on the job.

"We notice a big difference in power, weight and traction with this new machine. Cushion bulldozer and push block help, too. They give us on-the-go scraper contact—this cuts down on approach time. By reducing contact shock, we expect better scraper life. Tandem loading with the new D9G has helped us pull 40% ahead of schedule."

The new D9G has a number of pluses that make it right for dozing and ripping, as well as pushing. Here are only a few:

Engine delivers 385 flywheel HP—100 more horsepower than the first D9... weight is 64,800 pounds, 14% more than the first D9... a massive,

heavy-duty undercarriage lets the D9G take on the toughest ripping job... a power train with built-in ruggedness also has unit construction for fast servicing.

The D9G has Torque Divider Power Shift as standard equipment. This exclusive Cat feature combines the efficiency and snap of direct drive with the load-matching and anti-stall characteristics of torque converter. A single lever gives the operator finger-tip control of his machine. It means faster cycle times and greater efficiency. You get more out of the machine all day.

There's only one way to evaluate the D9G. Check it on the job. Your Caterpillar Dealer will be glad to make arrangements.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.



Greer Bros. & Young also use the D9G, equipped with 9C Dozer, to clean up the cut.

# CATERPILLAR

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## Tennessee 'Bottom' Job:

Superintendent Lee Birdsong inspects a ditch in one of his borrow pits.

Allis-Chalmers HD16 and HD21 tractors loading two A-C scrapers in the "big cut," nearing finish grade.





## Ditching Dragline Was the Scrapers' Best Friend

**T**he water marks seen six feet up on bridge piers were evidence that this contractor was bucking some more-than-ordinary problems—especially troublesome ones for a grading job.

The location was the "Hatchie River Bottoms" of southwestern Tennessee. L & A Construction Company, Hattiesburg, Mississippi, had two contracts for drainage, structures and grading on 14.5 miles of the new Interstate 40 about 50 miles from Memphis. The northernmost of the two contract sections, 4.9 miles long, was a \$2,250,000 job involving 600,000 cu. yd. of cut and fill and 650,000 yd. of borrow. And it was this section that penetrated the "bottoms," a low-lying area bordering the Hatchie River and laced with marshes and small tributary streams.

The principal difficulty lay in acquiring suitable borrow material within a practical haul range—this meant locating pits within the "bottoms." Tests showed that usable material could be obtained but the question was: how to combat the water in the borrow area, water which came not only from rains and resulting flooding by the river but also from a high water table peculiar to such low areas.

The Hatchie River can be counted on to flood every spring, according to local residents, and the "bottoms" are a natural dumping ground for much of its excess waters. In the spring of 1961, the river rose 18 ft. putting much of the "bottoms" under from 3 to 6 ft. of water.

The highway through the area is being constructed on an em-

An Ansley 3/4-yd. dragline cutting a bleeder ditch at one of the borrow pits. The different soil strata can be seen in the bank at left.





Interstate 40 job south of Brownsville, Tennessee. An Allis-Chalmers Scraper crosses a work bridge in this water-plagued job.

bankment 14 ft. above ground level. With the watershed flowing west, relief bridges have been built into the road to permit standing water to flow into the streams which feed into the river.

The big 600,000 cu. yd. cut was tackled first, however, because its "work bridge" over the river was needed for construction of the permanent highway bridge. The cut, which began almost at the north bank of the river, was 3,000 ft. long and reached a depth of 70 ft. The excavated material, 80 percent sand and clay, ran about 16 to 17 percent moisture and was put down without additional treatment except for occasional aeration on days following a rain.

Work began here in July, 1960, and stopped from the end of December to April 20, 1961. About 10,000 cu. yd. per day was handled on hauls ranging from 2,000 to 4,000 ft., and 7,500 cu. yd. daily on longer (6,000-ft.) runs. The size of the scrapers was limited to some degree by the capacity of the work bridge. The L & A fleet consisted of five Allis-Chalmers model 260 scrapers and one 200,

and three Euclid S12s. Two Allis-Chalmers HD21 tractors worked on pusher duty, with two HD16s and three HD11s spreading.

As this cut neared finish grade in June of 1961, preparations were well along toward opening two new borrow pits. Though the ebbing of winter floodwaters was followed by a rainy spring, the contractor had an ally in the hot mid-South sun. At one point in June, dirt work was down during eight consecutive days of rain but after a sunny and hot day of discing, men and equipment were back at work. It was found that the borrow area also needed but a day or two of drying to be workable. Thus surface water posed no great obstacle. But subsoil conditions in the borrow pits were another story.

Tests by the Tennessee Department of Highways disclosed a water table which came up as close as 6 ft. from the surface. These tests also revealed four layers of soil: a surface "buckshot" soil—a clay which breaks up into small particles—gray clay, blue silt, and water bearing sand. Knowing

therefore the depth of the water, the formation of the various strata and knowing that the water could move laterally, Lee Birdsong, L & A's superintendent, was able to locate bleeder ditches for most effective drainage.

A 15-ft. ditch, roughly in the shape of a right triangle, was cut into a borrow pit—with material scheduled to be removed to a 12-ft. depth. When scraper work was to begin, a 50-ft. section of drainage pipe was laid at the trench bottom and the ditch filled at that point to provide passage for the equipment units.

A Jaeger pump, operating at 90,000 gph for a 10-hour day, worked more than two months at this pit, though the spring rainfall contributed considerably to this output. The water was pumped to a machine-made channel which fed into a creek and thence to the river.

Superintendent Birdsong began moving borrow material as soon as he had sufficient room to maneuver scrapers. His technique was to go down immediately to a 10 or 12 ft. depth and then work

the scraper up through the various strata, thus achieving a consistent blend of the various suitable soils.

Bridges are much in evidence through this area, though the only grade separation for miles around will be that of the expressway crossing state route 76. The state highway, itself, is on embankment through the "bottoms" and contains about a dozen relief bridges in a single 1½-mile stretch.

Apart from the spans crossing the Hatchie River, there will be four pairs of relief bridges on Interstate 40 through the "bottoms" on this contract. The haul road itself has temporary spans at two locations (apart from the river)—"One is over Bear Creek, and we don't know what the other passes over; the only way to tell a creek here is whether it runs continuously all year."

When we asked if there were any other problems on this job, Birdsong said, "Well, snakes, for one. During the lunch break yesterday, for example, I saw three water moccasins roaming around near one bridge site. I was able to get a couple of them by kicking them, but the third was as big around as my forearm. I wasn't about to go near that one. I drove back to the plant for my shotgun, and finished it off from a safe distance."



Jaeger pump lifts water out of the bleeder ditch and into a channel, which carries it ultimately to the Hatchie River.



A Galion motor grader rolls across a creek on a temporary work bridge. Permanent structure at the rear.

## Shop Welded Box Girder—Quite a Haul

An example of shop welding is this 127-foot, 55-ton, all-welded box girder, for widening of Oliver Street Bridge in Indianapolis. It was made in Hetherington & Berner's nearby shop. It is 5 ft. in depth, with 48-in. flanges and internal open diaphragms every 5 ft.

To form an expanding Y-approach, a 103-ft.-long welded plate girder (not shown) angles in at 38½ degrees and is attached to the box girder near its center. Between the two are positioned wide-flange floor beams, bolted to the welded hanger plates on the girder web.

Most of the arc welding for the job was done by the submerged arc process, using ML-3 mechanized "Squirt" welding guns. Manual welds were speeded with the use of Jetweld 1 (AWS class E-6024) and



Improved Fleetweld 47 (AWS class E-6014), both being high deposition rate powdered iron designs.

Engineers and architects for the job were Robert L. Longardner and Associates, Indianapolis.



Pumped concrete comes out here, via a swiveling chute beneath a traveling gantry bridge that spans the deck being poured.

## Deck Concrete Pumped Via Traveling Gantry

**N**ew in Kansas, at least, is the method used by S. Patti Construction Company, of Kansas City, Mo., on an expressway deck in the Kansas City area. This firm which is a newcomer in the field of highway bridges decided to do the pouring with Pumpcrete equipment.

The project was a pair of spans 395 ft. and 416 ft. long for twin roadways on Interstate 35, known locally as Turkey Creek Express-

way. The Patti organization was given permission to use the pumping method, as a try-out, in the belief that it would accomplish a saving. Concrete from the Pumpcrete machine was piped about 200 ft. to a traveling overhead bridge or frame, from which it was deposited by a chute thru four gates in the gantry frame.

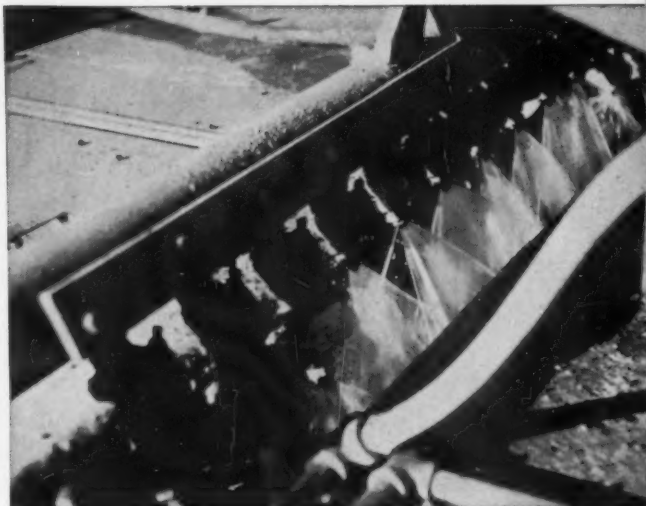
The method permitted concreting the full deck length, one-half

width, in a continuous operation. Kansas state highway personnel observing the work reported that the method proved "a little faster than convention method, but required considerably less labor." A larger pump was suggested for future projects of this size or larger. The method is seen to be of greatest potential advantage for decks that are in the "hard to get at" class for concrete placement.





Mixing Arquad 2HT in drum at highway test near Colfax, Iowa.



Water solution is sprayed over soil.

## Researchers Making Progress with Chemical Soil Waterproofing

**E**ngineers concerned with the age-old problem of stabilizing soils for road purposes will be hearing more and more about the new chemical approach to the problem. Research has shown results with a substance known as quaternary ammonium salt. It prevents volume changes normally expected from wetting or drying of clay or clayey soils.

A waterproofing chemical for this purpose has been made and is being marketed by Armour Industrial Chemical Company. Known as Arquad 2HT, the chemical is derived from hydrogenated tallow. It is a surface active agent which has the ability to change a surface from hydrophylic (water attractive) to hydrophobic (water resistant). Wide use is seen for this material because of the basic problem that still prevails of improving or preparing existing roadbed soils for stability in road construction.

Arquad 2HT, as reported by Armour, has the ability to react with such soil clay minerals as illite, kaolinite and montmorillonite. When

this reaction takes place, the clay particles are waterproofed and swelling due to water encroachment is significantly reduced.

At the same time the soil is waterproofed, its load-bearing capacity under adverse moisture conditions is increased. Tests have shown the unconfined immersed compressive strength of treated soils has been increased from 0 to 25-50 psi for highly plastic clays and to over 100 psi for less plastic soils.

When Arquad 2HT is added to water, it ionizes to produce positively and negatively charged particles. The positive portion of the molecule containing the nitrogen and the long fatty hydrocarbon chains attaches itself, by virtue of the cationic properties of the nitrogen, to surfaces which are generally negative by comparison. This attachment is called "substantivity" and is an electro-chemical bonding which holds the high molecular weight cation closely to the particles of clay.

This phenomenon occurs in dilute aqueous dispersions and the

Arquad 2HT is largely exhausted from the water as it absorbs on the negative surface. This results, in the case of clay, in a protective film on the particle which prevents excess water from reaching it. Thus the clay is waterproofed.

The amount of Arquad 2HT required to stabilize soils depends on the type and mount of clay present. Again quoting Armour, soils containing kaolinitic clay require the least amount of Arquad, from 0.01 to 0.05 percent; soils containing montmorillonite or illite may require 0.05 to 0.25 percent. Based on these concentrations, treatment costs for the Arquad are quite practical.

Arquad 2HT is added to the soil from a 3 to 4 percent dilute water dispersion, and is then mixed into the in-place soil to a depth of 4 to 8 in. to insure intimate contact with the soil. After the mixing, the soil is compacted and dry cured for seven days before construction of a base course and wearing surface.

An extensive laboratory and field research program has been conduct-



Processing equipment at work on Iowa soil waterproofing experimental project. A P&H Single Pass stabilizer is being used with cutter depth set to produce enough processed material for a 6 in. compacted layer. Water being applied through the spraybar at a rate set to produce a mixture at optimum moisture content. Arquad 2HT also applied in solution via spraybar.

The base course was then constructed using standard soil-cement procedures, compaction being done with a Seaman-Gunnison Duopactor.

ed by Armour Industrial Chemical Company. In 1957 the Iowa State Highway Commission and the Iowa Engineering Experiment Station Soil Research Laboratory at Iowa State University constructed a section of soil-cement highway near Colfax, Iowa, which contained an Arquad-treated subgrade or subbase. The project has been under

the guidance of Dr. D. T. Davidson, professor of civil engineering.

A 3300-ft. test strip of the highway included three sections of 6-in. subbase stabilized with Arquad 2HT, with lime, and with a combination of lime and fly ash; a standard soil-aggregate subbase was used in the non-experimental part of the highway. The soil material in the

subbase was the in-place material at the surface of the subgrade.

The 7-in. soil-cement base course and 3-in. Type B asphaltic concrete surface course constructed over the subbase courses are included as an integral part of the soil stabilization field trials only as the subbase courses may affect their performance.

THE HEAVIEST GIRDER ever fabricated at the Pottstown, Pa., works of Bethlehem Steel Company shown ready for shipment to New York City where it became an important part of the New Bruckner Expressway. Weighing 164 tons this built-up box girder required three cars, the center one an "idler." This assembly is 131 ft. long and 10 ft. 10 in. high. Fifteen double girders are needed for this project ranging from 53 to 164 tons.



Record-weight girder took three rail cars.



**Only the clam-action 4-in-1 converts** into a full-sized, full-capacity depth-controlled bulldozer. Simply open the clam, set

blade segment to cut, and roll the earth—as this International Drott TD-9 Four-in-One does, leveling spoil at a Texas missile base.

## Only 4-in-1 instant "convert-ability" multiplies your earning power!

**Prove the finger-tip ease and profit-ability** of instantly converting the 4-in-1 to get the actions you need. Prove that only 4-in-1 "convert-ability" multiplies your earning power—that you can't afford to own a "one-job" limited-duty loader. Let your International Drott Distributor demonstrate!

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



**INTERNATIONAL®**

**DROTT®**



**Only the "bucket with the bite" can convert** into a go-anywhere "grabhook"—that lets you sit and clam-on to hard-to-handle materials like stumps, brush, or boulders—to pile or load them under positive one-man control!

**No other loader converts and positions** for "back-drag" grading action—to streamline bank-shaping or sloping, above or below ground level—or to pull down materials wholesale on stockpiles or in pits. Only 20 minutes with this 4-in-1 saved two days of hand labor here!

**Only bucket on the market that converts** into a "carry-type" scraper, the 4-in-1 lets you grade with inch-close accuracy, and boil-in material on the go. This TD-9 Four-in-One, grading grounds of a new building, gets jobs that require a variety of machine applications!







## IS MAIN STREET HEADED FOR A CRACK-UP?

Civic pride starts with good streets, and there's no better way to make sure Main Street, or any other street in town, will keep up appearances than to reinforce it with USS American Welded Wire Fabric.

There is no arguing concrete's compressive strength. It actually improves as the concrete ages. But concrete lacks tensile strength, and steel is at its best in tension. Both compressive and tensile strength are needed to preserve the structural integrity of a concrete slab. Steel welded wire fabric is the ideal high-tensile strength material for concrete reinforcement. It distributes stresses uniformly throughout the slab and controls temperature, moisture, load

and soil shift cracking.

Actual measurement has shown that welded fabric's ability to control cracks adds 30% to the strength of the slab.

USS American Welded Wire Fabric is made of cold-drawn wire with a minimum yield strength of 60,000 psi and a minimum tensile strength of 75,000 psi. It is precision-made to your exact size and style requirements, ready for immediate placement. For full information, write American Steel and Wire, Dept. 1280, Rockefeller Building, Cleveland 13, Ohio.

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Columbia-Geneva Steel Division, San Francisco  
Tennessee Coal & Iron Division, Fairfield, Ala.  
United States Steel Export Company

## Photo Recorder Has Many Uses



Time-and-motion study projector permits films to be studied in the office. Single frames can be "held" on the screen for detailed analysis.

**A** new, lower cost method of photo-recording highways and their appurtenances is announced by Aero Service Corporation, Philadelphia. Called Photo/File, the recording system employs a specially modified 16 mm camera. It provides a sequential record of the highway at regular 1/100th mile (53 ft.) intervals.

Surveys so made are intended to aid in making sufficiency rating studies, or to be part of as-built surveys, inventories of signs and other roadside conditions. Other uses include studies of traffic channelization, roadway re-design, maintenance need and encroachment problems.

The survey vehicle travels at 5 to 60 mph continuously recording the highway situation at a cost of about \$15 per camera-mile.

A survey in Northampton County, Pennsylvania, represents the first use of the new system. About 523 miles of state roads will be recorded. Several other states are reportedly planning to use Bureau



Photo/File survey truck. Data gathered from the driver's point of view.

of Public Roads 11½ percent research funds for Photo/File surveys.

Records from these surveys are

compact; 10,000 miles of highway can be recorded on 500 film rolls and stored for quick reference in a single 24" x 24" x 30" file cabinet.



The Oklahoma Test Road north of Oklahoma City will eventually be part of Interstate route 35

## **concrete wins on Oklahoma Test Road** **with maintenance cost 65% lower than asphalt!**

5-year traffic test, ordered by the Oklahoma legislature, confirms again the findings of state highway departments and other official tests. Connecting two-mile sections of concrete and of asphalt, both the best of their type, were built in 1955 on Oklahoma's US 77. For five years beginning Jan. 1, 1956, exact records were kept of all pavement maintenance costs. Total for concrete: \$557.82. For asphalt: \$1,591.87. And not only did the asphalt cost nearly 3 times as much to maintain during the five years—it is already getting its first resurfacing at an additional cost of \$43,753.

Substantial maintenance economy is one reason why concrete is the choice of so many states today. Engineers are designing concrete pavements to last 50 years and more. It's the one pavement that can be designed *mathematically* to meet specific wheel load requirements. It's the only pavement with beam strength and stability.

The Oklahoma Test Road proves again the long-term value of concrete pavements. The first cost isn't just a down payment. Concrete provides true economy for Interstate highways as well as for other heavy-duty roads.

### **PORTLAND CEMENT ASSOCIATION**

*A national organization to improve and extend the uses of concrete*

#### **Complete resurfacing after only five years adds another \$43,753 to asphalt's upkeep!**

Despite continued surface maintenance for five years, the asphalt pavement on the Oklahoma Test Road has deteriorated to the point where complete resurfacing is required. The asphalt sections are being overlaid with 1½ inches of surfacing to seal out moisture and provide a new wearing course. When comparison is made, as shown here, on the basis of *total upkeep* cost, concrete's advantage is dramatic.

#### **CONCRETE**

5-year surface maintenance.....	\$557.82
total surface upkeep.....	<b>\$557.82</b>

#### **ASPHALT**

5-year surface maintenance.....	\$1,591.87
complete resurfacing.....	\$43,753.00
total surface upkeep.....	<b>\$45,344.87</b>



Bethlehem Formed Steel Bridge Flooring being installed on the Donora-Webster bridge over the Monongahela River. Contractor: Ferguson & Edmondson Co., Pittsburgh, Pa.

## Husky steel bridge floor adds new life to old bridge

When the bridge connecting the towns of Donora and Webster in western Pennsylvania needed reconditioning, some 45,000 sq ft of Bethlehem Formed Steel Bridge Flooring was installed over the bridge's steel stringers. The strong, formed-steel plate was used in 2-ft widths. It went into place quickly, providing a long-lasting, economical, and maintenance-reducing floor. After installation, a bituminous concrete surfacing was applied.

Bethlehem Formed Steel Bridge Flooring can be used for new bridge floors, or for reconditioning existing bridges. It meets the standard strength specifications for highway bridges of the American Association of State Highway Officials. For complete information on Bethlehem Formed Steel Bridge Flooring, call the nearest Bethlehem sales office.



for Strength  
... Economy  
... Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.  
Export Sales: Bethlehem Steel Export Corporation

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Why road repairs  
go faster when you

## DEPEND ON GYRO-FLO

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fuel economy and low oil consumption too, year after year.

Gyro-Flo portables are available in sizes from 85 to 900 cfm, in wheeled, power-take-off or truck-mounted units for any type of job.

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men met in Chicago to form a group which could speak for the construction industry. Subsequently the association adopted the slogan, "Skill-Honesty-Responsibility," later substituting the word Integrity for Honesty.

Membership in the fledgling group was limited to contractors with two years or more of experience and an established reputation for these three attributes. Guided by this theme and with a purpose of fostering performance always in the interest of the owner and the public, the AGC has through the intervening years seen the construction industry become one of the giant segments of the economy—and until recently to see the general contractor's reputation maintained at a level far above the old-time "scoundrel" image.

"A man whose verbal word is often good for millions of dollars of construction—one of the magnificent examples of free-wheeling American enterprise," to use Klinger's words. He stressed the pride that the members have long had in their AGC membership.

"Then into this picture came the shadow," to further quote this elder statesman. "A period of soft morals has brought public revelations which have tarnished the whole industry, however few individuals have been involved."

After reading excerpts from editorials, and citing specific situations that have made unhappy news, Klinger asked, "In behalf of the 99 percent who follow the Integrity banner, what are we going to do about this? . . . The AGC leaders are here in New Orleans to decide." At this point he called on the audience to endorse a program of action to rid the industry of improper practices and brand as betrayers of the association any members who fail to live up to AGC's historic preamble.

Klinger spelled out some of the specific acts that constitute questionable dealings, such as entering into improper relationship with the owner's employees, or failing to fully support the objectives of the awarding agency and give it full value. These acts, said Klinger, should call forth the association's power to expel. He asked that the AGC board rewrite the code and face this expelling action, rather than dilly-dally along until some outside action be necessary. And he called for a ringing statement to the public condemning the small percent who have brought ill repute and expressing determination to rule this element out.

#### **New Job Rules Squeezing Profits**

Coming back to the second of the top topics at New Orleans, nearly half of the long afternoon session of the highway contractors was taken up by an airing of the contractor's woes under the new quality control procedures of the highway departments. Floor leader was W. F. Maxwell, of Fontana, California, a regional co-chairman of the AASHTO-ACG joint cooperative committee.

The Bureau of Public Roads, Maxwell noted, was interested only in good work and honesty until the Blatnik committee's investigations came along. This also went for the states. Then came the Bureau's memorandums setting up new inspection and testing procedures. These edicts caught the contractors flatfooted with new job requirements and increased delays. Contractors went "volume crazy" trying to prove quantity or dimensional accuracy. Inspectors began using the book as a Bible, not just as a guide. From every part of the country came reports of increased costs from "over-zealous, late or unfair testing, delayed field decisions, and slow final payments," to name only part of the list of particulars.

On one state, said Maxwell, over 900 contractor claim cases are piled up.

Even without inflation, contractor costs are rising by reason of these unrealistic and unnecessary job conditions, this speaker went on, and the construction industry will price itself out of the market long before the 1972 completion of the long-range highway program.

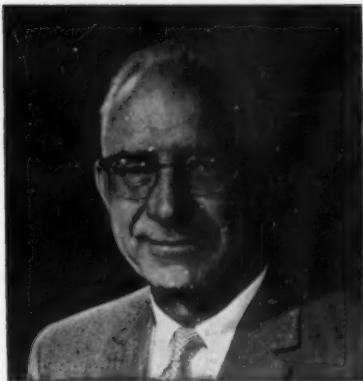
This speaker and others rising from the floor called on the AASHTO to see the fallacy of over-inspection and the harm that is coming from slowness and indecisiveness in documenting field changes. "We cannot speak emphatically enough on this situation," said one spokesman. This kind of problem previously was an isolated one. Now it is pictured as nation-wide, as a result of the Bureau's memorandums. The requirements imposed are often clear out of keeping of the intent of the specifications.

Also the situation is accentuating the shortcomings of the field personnel in many states, another contractor chimed in. This speaker went on to cite case after case, as for example of the inspector who doesn't show up on the job until two hours after the contractor has tried to get started, the inexperienced summer students in positions that affect the contractor's work, the lack of cooperation between field and office, and failure of the higher-ups to give clear decisions.

Then comes the final inspection, he went on, with representatives from the Bureau, the chief engineers, the division or district, and others, who seem capable of everything but the decisions needed to get the contractor out and clear. This contractor criticized the preoccupation with costly, fund-wasting polishing of slopes and other unnecessary clean-up requirements—things that cost the contractor profits unless fully allowed for in the bid.

And, this spokesman kept on, what of the engineer who stakes the job wrong, then denies it or argues over who pays for taking out the misplaced dirt? This, he said, is one of innumerable acts that really constitute fraud against the contractor. As another example, grossly inaccurate borrow pit measurement.

"Will the Blatnik committee investigate this inspector?" he challenged. "Does the book give an inspector the right to say 'I'm always right,' even when he is fraudulently wrong?" . . . For now, it looks



#### TOP LEFT

AGC president nominee Frank F. Burrows.



#### TOP RIGHT

M. Clare Miller, who has headed AGC during 1961 and whose testimony was often heard on highway legislative matters in Washington.



#### BOTTOM LEFT

Speaking at the New Orleans AGC meeting: R. W. McKinney, of Texas, chairman of the highway contractors' division.



#### BOTTOM RIGHT

William A. Klinger, of Iowa, AGC past-president who spearheaded action on ethical matters at New Orleans.

like we are defeated in our effort to get correction of these unfair practices. But let's don't give up. Let us go back to our states and appeal to the sense of fairness of the engineers. Let us of course put our house in order if it needs that."

The bad acting contractor, he said, may represent only one percent of the contractors but this situation hits 100 percent of them. "All we want is fair treatment," he said, adding that contractors can't get anywhere at the AASHO level at the moment. He recommended this problem as a reason to activate dormant state cooperative committees with the highway departments. Highway engineers, actually, are reasonable men, he said, who will listen to facts.

Another contractor took up this onslaught where the former left off. He said that the BPR, with its power to withhold funds until conditions however unfair are complied with, is in a sense compounding a felony. He, too, voiced the observation that the state engineers are running scared—afraid their jobs are in jeopardy, hence their extremes of action.

In Nebraska, still another representative said, contractors were told they couldn't sue the state. A suit was brought, nevertheless, and is before the supreme court.

#### "Document Your Case with Facts"

This hour-long outburst, revealing the deep concern of contractors who have millions at stake in their

jobs, was brought to a constructive head by AGC's president M. Clare Miller. Miller, himself a highway contractor, warned the members and their state chapter leaders to approach their respective highway departments only with factually documented cases of excessive or increased costs due to the practices in question. He said that the contractor should not concern himself with the specifications, as such, except to note where their meaning is not clear. "If we keep to a solid factual basis, we will be on solid ground," were Miller's words.

Miller went on to observe that the new climate created by the Bureau's Blatnik-inspired policies is fostering poor engineering. It gives the mediocre engineer a blanket under which to crawl. "We may be cut off from communication with the BPR right now, but examples of documented cost increases will, if accurate, get to Congress. . . . Let us concentrate to show examples of cost rises that don't justify the means and which are keeping the taxpayer from getting his money's worth."

Frank F. Burrows, building contractor, of Belmont, California, was nominated 1962 president of AGC at the mid-year board meeting. He will succeed M. Clare Miller, a Kansas highway contractor. Vice president elect is Charles Keller, Jr., a heavy contractor, of New Orleans, La. Election will be by membership ballot with installation during the Association's annual convention at Los Angeles February 25 through March 1.



## Concrete Batching and Mixing Plants

*Continued from page 49*

Aggregate elevators claim the No. 1 position on space-saving and low initial cost, and are widely used where production demands are moderate. Standard, pre-engineered units in several grades and sizes are available.

### "Add-On" Accessories

The general design trend of today's batching and central mix plants is to provide for the addition of automatic and semi-automatic controls and other accessories to up-grade the equipment or alter it for specific projects.

Output speed, for instance, can quite obviously be increased by installing a batcher of greater physical size (3 to 6 cu. yd.). Or it is possible to add more batchers—each with its own scales—so as to weigh components simultaneously instead of cumulatively. Larger, air-operated gates will also speed the material flow to and from the batchers.

All of these alterations may be made to today's

plants. Older plants, too, may be converted and upgraded, but these alterations should be made by thoroughly experienced engineering personnel to take maximum advantage of manufacturing standards and the latest technical economies.

Contractors and concrete producers are thinking to the future, and the direction today's trends will take them. Since the investment in any major batching or central mix equipment is normally amortized over a five-year period, progressive contractors are discussing their needs with a concrete plant distributor or manufacturer who offers a modern and complete line of permanent, portable, and mobile equipment as well as one who is knowledgeable in the latest material handling methods. Such a consultation results in a fair comparison of relative costs of the right equipment to fit the contractor's production requirements now—with provision for "add-on" accessories in the future.

Today's keenly competitive market calls for an even closer look at the economics involved in any equipment purchases. Keeping abreast of the new equipment available and its advantages will go far in building a brighter, more profitable construction future.

## Yardage Booster: Tandem Scrapers, Tandem Pushers



On a joint venture, North Dakota contractors Wm. Collins & Sons, of Fargo, and Joe Mayo Construction Co., of Cavalier are building a section of Interstate Highway I-94 between Glenn Ul-

lin and Hebron, N. D. Included in the 10-scraper earthmoving fleet is this LeTourneau-Westinghouse B. Tournapull with tandem scrapers. Here, building a 500-ft. approach to an overpass of U. S.

Highway 10, the tandem unit, pusher-loaded by a pair of Caterpillar D-9 tractors, loads about 43 bank yards of hard sandy clay and pre-ripped slab sandstone. Workweek is 6-days, 60 hours.



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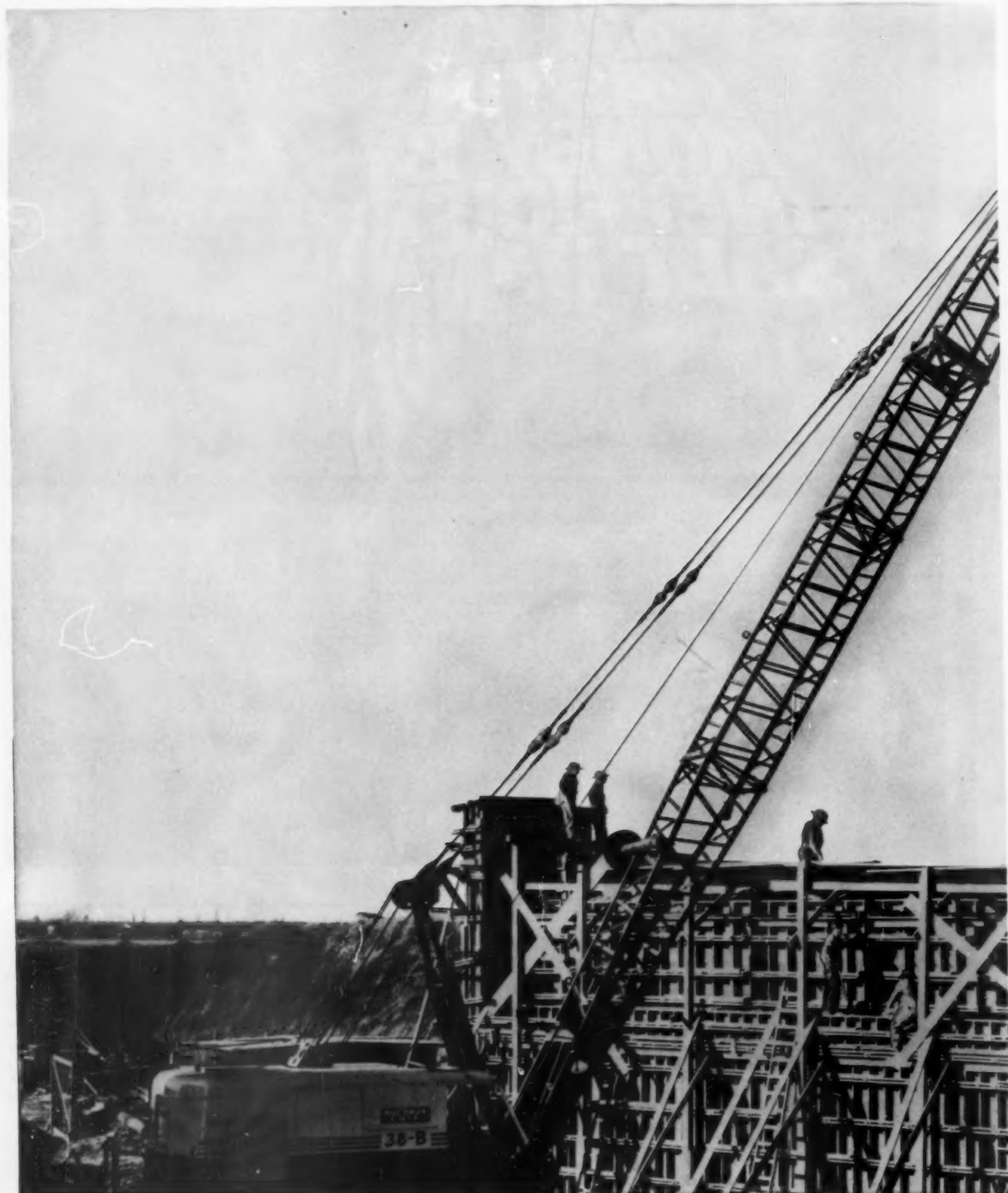
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**Bulldozer and wagon scraper ropes** are designed for long wear with strength and flexibility.

## Court Decisions

### Subcontractor Or Supplier

A contract was entered into with the Mississippi Highway Commission by Heck Webb, representing Mid-State Paving Company. The contract provided for paving a public road in Clarke County, Mississippi.

After this contract had been made Webb agreed orally with the Richton Gravel & Concrete Company for the necessary washed

gravel, to be delivered at the pits. The Richton Gravel & Concrete Company's gasoline and diesel fuel had been purchased from the Blue Lightning Service Company for use in the mining of the gravel.

Subsequently suit was brought by this gasoline and diesel oil dealer for an unpaid balance, in which it was charged that under the agreement with the Richton Gravel &

Concrete Company it had furnished diesel fuel and gasoline to enable Richton to wash the gravel that Richton had agreed to sell to Webb. Judgment was asked here against Webb and his surety on the ground that the Richton Gravel & Concrete Company was a subcontractor of Webb.

In reversing a judgment against this contractor and his surety the Mississippi court said, "We are of the opinion that Webb and his surety are not liable to claimant under the facts of this case. It will be noted that the claim of the Blue Lightning Service Company rests upon its furnishing diesel oil and gasoline for the production by Richton of gravel.

"Webb had simply agreed to purchase gravel from Richton. Richton was under no obligation to do anything whatever towards the construction of the road. All it did was to sell to Webb gravel delivered at the pits. It had no responsibility to see that the contract with the State Highway Commission was fulfilled in any respect.

"There is nothing peculiarly applicable to paving the road in the type of diesel fuel and gasoline furnished by Blue Lightning. The same type of fuel could have been purchased by Richton from many other dealers in such fuels."

Then, in distinguishing these suppliers of gasoline and fuel oil from subcontractors the court added, "'Subcontractor' has a well defined meaning in building contracts and as used in this technical sense it means one who takes from the principal contractor a specific part of the work and does not include laborers or materialmen.

"Under the authorities one who takes no part in the construction of a building but merely furnishes material for use in a building, is not a subcontractor and if the claimant is employed to furnish material only, whether fabricated or made ready for use or not, he cannot be regarded as a subcontractor.

"The contractor and his sureties are liable for material furnished to a subcontractor but are not liable to one from whom the materialman purchased material."

*Webb v. Blue Lightning Service Co., (C.C.H.) 38 Lab. Cas. 68,823, U. S. Dist. Ct.*

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This speedy heat is released when Columbia Calcium Chloride (High-Test Flake) goes into solution in contact with ice or snow. It triggers rock salt at all temperatures in mixes. And it's the premium ice melter for trouble spots.

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Specify heat-producing **COLUMBIA CALCIUM CHLORIDE**



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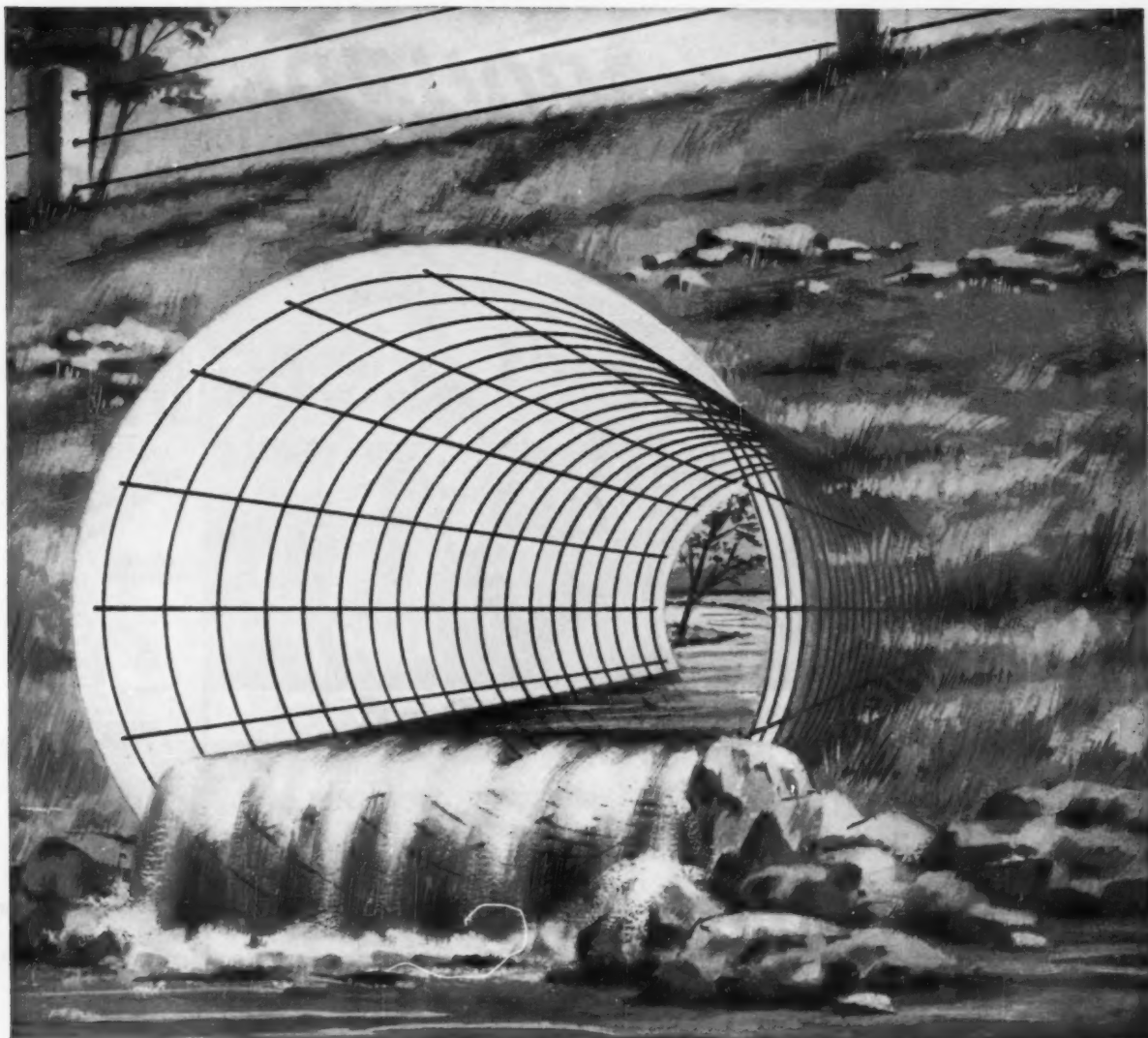
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### CF&I Welded Wire Fabric lengthens it

In culverts and drainage systems, concrete pipe has to fight a constant battle against external pressures. But it has a powerful ally in CF&I Welded Wire Fabric.

Reinforcement with this tough steel mesh combines the strength of steel with the permanence of concrete. The result is pipe that has greater structural

strength, maximum corrosion-resistance, and the overall toughness that means long, maintenance-free life.

CF&I Welded Wire Fabric meets all ASTM specifications and is available in a wide range of gages and spacings to meet virtually every requirement. Ask your CF&I salesman for complete details.

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## 180° SPEED SWING

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No other equipment in the material handling field offers as much *all-around safety* as the Pettibone 180° Speed Swing!

The exclusive Pettibone 180° boom swing permits the operator to load either alongside or in back of trucks. The long boom is located forward, keeping the bucket far out in front of the operator to provide fullest protection from spilled loads. There are no side arms to endanger the operator, as with other loaders. Also, being closer to the ground and with no obstructions around the seat, he can get on and off the machine easily . . . from either side!

Because of its 180° swinging boom, the Speed Swing is not forced to maneuver back, forth, and all around constantly when loading. It **SWINGS THE LOAD** instead! This means far fewer machine movements and faster work cycles . . . with greater safety to other

workmen, other equipment, and to moving traffic on streets or highways.

The long boom reach prevents bumping trucks when loading from side or rear. Other type equipment cannot provide this high safety factor. Also, the longer wheelbase, wider tread, and low center of gravity mean more stability and greater safety in moving heavy loads.

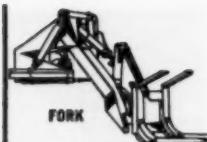
And there's full operator visibility for any one of the 10 quickly-interchangeable attachments shown at right, at all times during use. To top it off, you make the *safest investment of all* when you choose the Pettibone 180° Speed Swing . . . the most outstanding all-purpose material handler for **ALL YOUR JOBS!**

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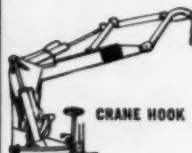
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FORK



BUCKET



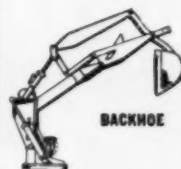
CRANE HOOK



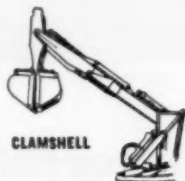
16' BOOM  
EXTENSION



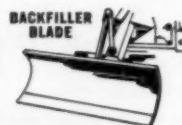
WIRE & PIPE  
HOOK



BACKHOE



CLAMSHELL



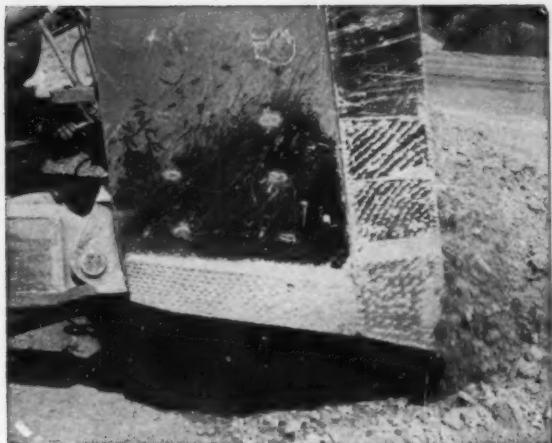
BACKFILLER  
BLADE



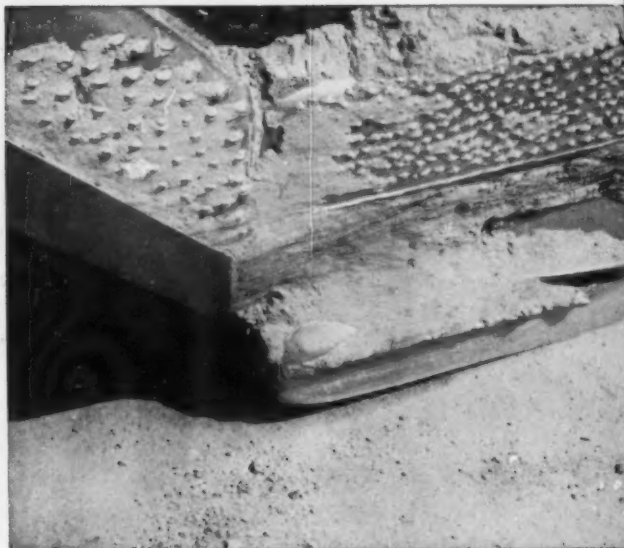
BEACH RAKE



4 CU. YD.  
SNOW BUCKET



Combination of abrasion and impact is death on dozer cutting edges and sides on a job like Atkinson's. If normally hardfaced, excessive heat built-up during welding would probably remove much of the wearing qualities of the rod. Using dot system assures retention of best hardface qualities while using less rod and less time.



Sides of scrapers "melt" in abrasive sandstone. Use of these easily applied hardfacing dots has tripled the service life of this equipment. Yet this treatment, the owner has found, a relatively small amount of hardfacing material and can be applied by semi-skilled welder.



The life of this breaker on a ripper shank has been doubled by application of hardfacing dots. Note off-set pattern and use of heavier warts along edges where wear is faster.

## The Best Hard Facing Pattern?

# 'Warts' Say Atkinson's Welders

**G**uy F. Atkinson Company's crew working on the Santa Monica mountain section of the San Diego Freeway in southern California, recently have peeled out and moved out sandstone at the rate of nearly 20,000 cu. yd. per day with rippers, dozers and belt loaders. This may spell profits to the management, but to the mechanics it spells another word—wear. Equipment maintenance has been a big problem. Particularly, abrasive wear of cutting edges and rippers has kept the field shopmen hopping.

Ripper teeth behind the Caterpillar D9s and the Euclid TC-12s seemed to melt in the highly abrasive and often cemented sandstone. In some areas, tooth life was four hours.

To reduce this wear as much as possible with a minimum of time and material, Atkinson's welders have settled on use of a "dot" pattern for hard facing shanks, breakers and side sections of dozer blades and scraper pans where abrasion can be particularly destructive.

The Atkinson dot technique is

nothing more than the spotting of hard faced warts on the wearing surface. Carefully placed to offset particular wearing conditions and with hard facing material selected to withstand varying job conditions, the technique has proven to be easy to apply and obtain excellent wearing characteristics.

An important attribute to the dot system is the retention of the best wearing qualities of the alloys used, the company's men feel. This results from rapid dissipation of heat during the welding process. The





Guy F. Atkinson is peeling sandstone out of San Diego Freeway cut at rate of 20,000 cu. yd. per day, yet keeps high-powered equipment on the job through novel "dot" hardfacing of cutting edges and rippers.

high heat build-up of the bead in normal hard facing work is not present where a small dot on the surface of the original material is all that's used for the treatment. This enhances the wearing qualities of the dot, and it reduces the degree of wearing quality lost in the original surface.

The welding material used ranges from hard facing with high abrasion resistance to material with very high impact resistance. According to Atkinson's shop personnel, the only way to know which of several grades to use is to go out on the job

and watch the equipment at work, then select the material that looks like it will withstand that particular use the best.

Dots are generally centered about 1 in. apart and offset each other so there is a minimum of coursing action and channeling of the original wearing surface by the flow of abrasive material. Dot height seldom exceeds  $\frac{3}{8}$  in. and is more often around  $\frac{1}{4}$  in. Obviously, this method of wearing surface preservation can be handled quicker than the solid overlay technique and does not require the skilled welder

demanding of conventional overlay methods. There is a corresponding saving in the amount of material used, which adds to the economy of the dot technique.

How effective is it? The Atkinson maintenance men note that under the highly abrasive conditions of the San Diego Freeway cut, the addition of the hard face warts to the wearing surface of new scraper sides has increased their life three-fold. They believe the use of such treatment on the sides of their dozer blades is resulting in an equal increase in operational life.

### Skiddy Bridge Deck Roughened with Diamond-Cut Grooves

When the curved deck of this bridge near Los Angeles became slick from an accumulation of tire rubber and oil, diamond saws were used to give it a skid-resistant surface. The diamond saws are spaced on the cutting head of the machine to cut shallow parallel grooves into the pavement.

This fast method for correcting unsafe slippery pavement surfaces is being used on both concrete and asphalt pavement. Concut Sales, Inc., El Monte, California, has used the machine to remove slick



surfaces from highways, bridge deckings, swimming pool deckings, sidewalks and industrial plant

floors. It is also used to scarify old pavement prior to overlaying it with new material.





Workmen level on side of ditch and dig two trenches where the edges of the glass fiber blanket will be toed.

## Soil Erosion Control

**A** new glass fiber blanket is being used to aid in the reduction or elimination of soil erosion along roadside areas. The inorganic material, Ultrachek, according to Gustin-Bacon Manufacturing Co., is bonded together with a permanent thermosetting resin to produce a mat of extremely high strength.

In a typical parallel drainage ditch application, where erosion has been working its way toward the highway and up the embankment, this blanket can be applied to con-

trol further erosion. One side of the ditch is leveled and a trench dug along each side of the leveling. These trenches, called toe-in ditches, are cut 10 in. deep on the highway side and 18 in. on the ditch side. The blanket is rolled out over the prepared area, toed-in and secured with steel T-pins. The blanket can be cut and worked around obstructions and pinned in place.

Need for reditching and other maintenance work is almost eliminated by this procedure, the manu-

facturer states. After vegetation begins to grow through the mat, greater permanence and protection is gained.

The mats can be used to replace ditch check dams, slowing movement of silt in the running water and allowing it to settle to the bottom of the ditch. The water, too, tends to sink into the ground.

Under-bridge berms can be blanketed and then asphalt covered, often at a saving over other forms of slope protection.

The glass fiber has been rolled out over the prepared area. It is then toed in on either side and secured with steel T-pins.



The final product is this neatly matted roadside ditch that will resist erosion and save maintenance.



# New Mixing Grade Cationic Bitumuls gives 3 days' work in 2



*Rich, black Cationic Bitumuls mix laid down in 10' (half-width) panel.*

Check this profit-making arithmetic!  
When you use new Mixing Grades Cationic Bitumuls—even with fine-graded aggregates—you get:

**Easier Mixing**  
**+ Faster Curing**  
**3 Days' work in 2**

That's been the story in Douglas County, Oregon, where their Forces

used this binder with crushed, pit-run gravel in a Moto-Paver to surface a 2.5 mile section of new road construction. This saving of time, of course, means important reduction in cost.

Because it strongly out-performed the highly-treated RC-3 cutback previously used, Mixing Grades Cationic Bitumuls is now used extensively for Moto-Paver work in Douglas County, with pre-tested aggregates.



*Fast mixing with Cationic Bitumuls (nearly 50% more than earlier production with cutback) kept aggregate trucks on the go.*

## Job Report — Mixing Grade Cationic Bitumuls

**Location:** Looking Glass Road, Douglas County, Ore.

**Type of Work:** Moto-Paver 2" surfacing on new road.

**Engineers and Titles:** Mr. Al May, County Engineer; Mr. Harry Morrill, Assistant County Engineer.

**Date:** July 10, 1961.

**Specifications:** Size specifications of crushed, pit-run gravel ( $\frac{3}{4}$ "-0) only specification involved.

**Work Done By:** County Forces.

Crushed, pit-run, graded Umpqua River Gravel (100% passing  $\frac{3}{4}$ "; 38% passing #4; 28% passing #10; 3% passing #200) was selected as aggregate for surfacing. Laboratory tests on this aggregate determined the proper grade of Cationic Bitumuls.

(Note: With earlier Cationic emulsions the aggregate had to be screened and graded, with minimum size about  $\frac{1}{4}$ ".)

Mixing and placing were done in the usual way; but the Moto-Paver crew estimated through-put at nearly 50% more than the production with the RC-3 treated cutback. Reason: easier mixing and handling of the Cationic Bitumuls and the resultant mix.

**Job Procedure:** The crew on the Moto-Paver place a 10' lane on one side of the road to the full length of one day's production. Next day they paved an adjacent 10' lane to complete the 20' surface width.

To get traffic through the job, vehicles were routed over the day-old Bitumuls surface. This traffic is generally light, but does include some loaded logging trucks. The Cationic Bitumuls surface showed no displacement under wheels. With the old cutback mix, marked displacement had occurred.

In many instances when job size, job location or other factors make the use of hot plant mixes impractical, you can benefit from this time-saving, money-saving performance of new Mixing Grades Cationic Bitumuls on either new road construction or maintenance work. Call our nearest office for full information.



*Rapid cure of Cationic Bitumuls mix let roller work closer behind the paver.*

*A good, rich mix with excellent coating—faster mixing with Cationic Bitumuls actually improved quality of finished material.*



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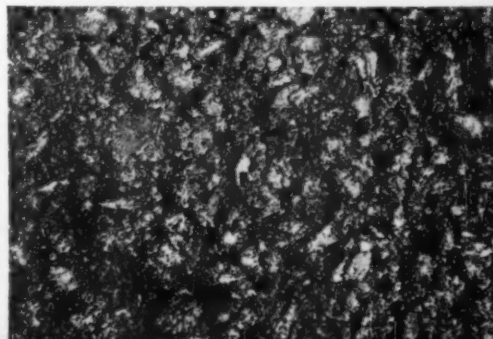
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Rosco 1,200 gal. distributor on Ford C-800 truck apply Penepriime. Close-up of Penepriime, one hour after application.



Surface texture and penetration, two days after application.

## New Prime Used to Hold Exposed Base Under Traffic

By H. K. Glidden

Field Editor

**H**OW do you hold a blow sand base in place during the period between its completion and surfacing—particularly when the road must be quickly opened to traffic? The Colorado department of highways has fought this battle in eastern Colorado for years. This area is almost devoid of suitable base course aggregate. The existing soil is a blow sand—stable only when treated and tightly confined. Having a PI of minus 6, it has

practically no binding qualities. Experience has shown that adhesion and stability can be obtained by adding two percent portland cement (base grading B). Other low cost methods of stabilization have been used. However, traffic has always pounded out holes, and raveling has predominated in the roadway before the surfacing could be applied. Normal prime coats have not helped much.

Now, early results indicate that a new priming material, Penepriime, used in conjunction with soil stabilization, may provide a satisfactory answer to this problem.

Here is an account of the use of this material on 7.6 miles of Colorado state route 50 south of Cheyenne Wells. The original

scope of this secondary road contract included grading and structures only. C. L. Hubner Construction Co., of Denver bid the job at \$160,000. Since the 2-in. hot-mix surfacing would not be contracted until 1962, the problem remained of holding the surface smooth and dust free for almost a year. As the grading progressed it became obvious that some method of stabilizing the blow sand must be employed—otherwise the road would be almost impassable. The decision was to include a 4-in. cement-treated base and Penepriime treatment by a change order at an additional cost of \$15,000. Penepriime was applied at 27 cents per sq. yd. compared to 17 cents for MC-2.

**Bituminous  
Roads And Streets**





A Bros Roll-O-Pactor tightening up the surface after the fog spraying.



Surface texture after several days use by moderately heavy traffic.

The cement treated base was easily handled while at the same time allowing traffic to use the roadway. After normal compaction and curing it was ready for the prime.

The immediate problem in priming a base course has been the delay between application and curing to a point where traffic would not pick up the prime. When MC-2 was used, the curing time was too long if the application was heavy enough to secure adequate penetration. Light application of MC-2 cured quickly but would not hold the surface. Users complained bitterly when a road was closed for more than a few hours.

In searching for a panacea, Peneprime was investigated. Peneprime is a proprietary product marketed by the Empire Petroleum Co. This prime uses low penetration asphalt (generally less than 15), cut with a volatile solvent. The material was recently developed by Jewell R. Benson, consulting bituminous engineer. Several Colorado counties and private concerns had applied Peneprime under similar traffic and soil conditions. These users

reported deep penetration in a matter of a few hours. More important, they also found the resulting surface to be exceptionally tough and traffic resistant. Based on this information, the Colorado highway engineers decided to try Peneprime on this project.

The first step was a tight blading to shape the surface and re-

move loose material. Next came a fog sprinkling with water to barely dampen the surface. A slight moistening was found to speed up the penetration of Peneprime. The moist surface was then rolled with a pneumatic roller. When the moisture was judged to be correct, the Peneprime was applied at 175° F. with a 1,200-gal.

### Editor's Note

During the autumn, according to state district engineer George N. Miles, a light seal coat was to be placed over the Peneprime here described, using RC-3 material. The prime itself, however, was reported to be holding well after two months of traffic.

Of interest here also is comment made to Roads and Streets by Jewell Benson, Consulting Bituminous Engineer, who developed the Peneprime. He said: "While the advantages of Peneprime include rapid absorption and to appreciable depths, its main feature in my opinion, is the very high cementing quality

obtained with the material. This contributes to the hardening and toughening of the primed surface—which conditions are seldom obtained with normal MC priming materials."

"However, in passing, I might mention that most engineers are more concerned with the prime going in quickly, than on the character of the resulting surface. That is where our "educational" phase of the work must come in. There is a very disconcerting lack of concern on the part of so many engineers (and county-city personnel) as to the final character and behavior of much road and highway work."

Rosco distributor. Application was started at the rate of 0.4 gal. per sq. yd. but later reduced to 0.35 gal. to shorten the curing time.

The total width of the prime was 32 ft., requiring three passes with the distributor. To accommodate traffic, only 22 ft. of the roadway was primed at a time. Traffic used the cement-treated base while the prime cured. The remaining 10 ft. was primed the next day. This procedure required that the length of roadway primed

at one time be correlated with the supply on hand in the transport truck. The length was usually about one-half mile.

The prime could receive traffic in about five hours and had then penetrated an average of  $\frac{3}{8}$  in. At the end of two days the penetration reached one inch. The surface was tough and highly traffic resistant. In discussing the results, George Miles, district engineer, was reservedly enthusiastic. He wanted to observe the results for

sixty days before making up his mind.

Equipment and Men on Project. In applying Penepreme the contractor used a Cat 12 motor grader; Bros Roll-O-Pactor; 4,400-gal. water tanker, and a 1,200-gal. Rosco distributor on a Ford C-800 truck.

George Aldredge was superintendent for the contractor. H. W. Jackson was project engineer for the Colorado department of highways, assisted by W. H. Courtney.

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## Asphalt Paving Quality Study Report Issued

A 21-page report on the "Effect of Aggregate Coating on Hardening of Asphalt Cement" has been released by the National Bituminous Concrete Association. The study is a part of Point VII of NBCA's 10-point Quality Improvement Program.

In this study, NBCA found that factors other than aggregate characteristics are involved in asphalt pavement failures such as cracking and delamination (the peeling off of pavement surface in fine layers). At the request of Charles R. Foster, NBCA Research Coordinator, Miller-Warden Associates made primary tests to determine if the fine material (minus No. 200 sieve) from two selected aggregates—a Virginia sand and an Oklahoma gravel—had a hardening effect on asphalt cement. Miller-Warden engineers had pre-

viously noted such hardening as a characteristic of certain aggregates in New Jersey, Delaware and North Carolina.

When these tests showed no indication of any unusual degree of hardening in either case, the original project was broadened to include tests which might reveal other deleterious effects from the aggregates and a literature search to locate other possible causes of delamination.

The report lists seven possible causes of scaling of sand asphalt surfaces at one time or another, but places heavy emphasis on the hypothesis that scaling occurs as a result of the pressure induced in the water on wet asphalt pavement by traffic. The tires force the water through the pores in the pavement, breaking up the asphalt-filler films.

It is noted that this condition is easily controlled in other parts of

the world—in London, for example, where damp foggy weather prevails—through the use of harder asphalt and thicker films, or higher asphalt content and more filler. But the NBCA report questions whether it would be more economical in the U.S. to increase the asphalt and filler in all pavements to reduce scaling, or to replace those few sections where scaling takes place in the ordinary sand asphalt pavement.

The report offers two recommendations for the reduction of scaling: (1) reduce the size and volume of voids in the sand asphalt, and (2) increase the resistance to flow of the asphalt-filler mastic. This can be accomplished by increasing the percentage of filler to above 10 percent by weight (by choosing a filler which contains at least 30 percent by weight of particles finer than 20 micron) and adjusting the percentage asphalt to a compatible level.

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## Safety Foundation Enters Road Construction Planning

The Automotive Safety Foundation announced today it will expand its highway research program to help States plan future highway construction.

J. O. Mattson, President, said the first project under the new program will be a study for the State of Washington to develop procedures for scheduling highway improvements on a priority basis, with construction geared to revenues avail-

able under the State's existing tax structure. The study will be made at the request of the Washington Legislative Joint Fact-Finding Committee on Highways, Streets and Bridges and the State Highway Commission.

Mr. Mattson said the year-long project will include a review of the State's highway administration and its system for classification of roads and streets into areas of State, county, and city responsibility.

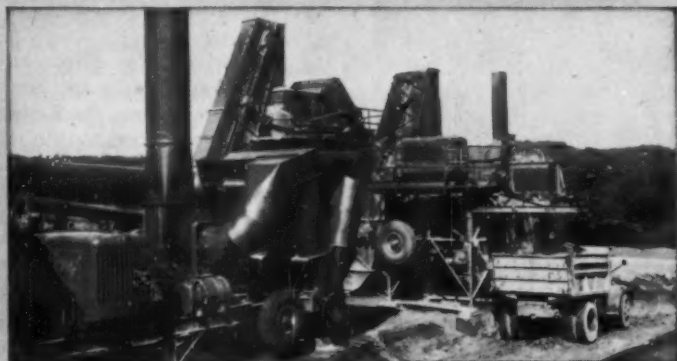
The Foundation has completed similar studies in Kentucky, Tennessee and Rhode Island. These surveys and the highway needs

studies made by the Foundation in 27 States and two Canadian Provinces since 1946 has shown the necessity for more work on highway programming, management and classification problems, Mr. Mattson said.

It is essential, Mr. Mattson added, that highways be constructed and maintained with a minimum of waste. This can be done, he said, only if States schedule projects according to their greatest possible benefits and provide for the efficient management of facilities by the administrative agencies most logically responsible for them.



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ROADS AND STREETS, December, 1961

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83

# Open-Graded Asphalt Mix - Pros and Cons

By W. R. Lovering

Division Paving Engineer,  
The Asphalt Institute  
Sacramento, California

To the Editor:

To answer your inquiry, these notes may give some perspective on the open-graded mix being used for the thin wearing surface on such projects as the I-15 freeway project north of Baker, California.

The use of open-graded mix in California goes back a good many years. To the best of my knowledge, this type of construction was first proposed by F. W. Hazelwood, district engineer, in District II, Redding, California. While on a vacation trip he had seen the material used in Virginia and for this reason the early projects were referred to as "Virginia Mix." The Virginia Mix was used quite extensively for a few years and then apparently fell into disfavor. I am not sure, but I believe the reason was that considerable ravelling was experienced on some of the projects.

Another open-graded type pavement used about this same period was a mix based on the Bureau of Public Roads' specifications and I believe it was designated as "Type F-2 mix." This consisted of a coarser open-graded plant mix put down in a considerably thicker layer and then keyed with a finer open-graded plant mix, followed by a seal coat. If I remember correctly, this mix was developed by Don Steele of the Bureau of Public Roads to fit a particular pit in Arizona and was then included in their Standard Specifications. One of the disadvantages of this type of construction in California, however, was the fact that water became trapped in the coarse, open-graded mix and could not escape

because of the surface seal.

In 1948 George Hellescoe, district engineer for the California Division of Highways in District I, Eureka, proposed the construction of a 1/2-in. open-graded mix for use through the city of Eureka in lieu of a chip seal. His primary concern was to avoid the dust nuisance that usually exists with a chip seal on city streets. For this mix we worked up a 1/4-in. maximum size grading, which was somewhat finer than the gradings previously used and the mix was placed 1/2-in. thick. This pavement performed very well and the 1/2-in. thickness of open-graded mix was used on a number of Redwood Highway projects—jobs where satisfactory chip seals had not been obtained in the past, due to variations in climate and the fact that

the asphalt used for chip seal did not cure rapidly enough in the shade prevalent along the Redwood Highway. Very good results were obtained on these projects and I believe they were responsible for the renewed interest in the open-graded construction.

The present Standard Specifications of the California Division of Highways contain two open-graded mixes; one the 1/4-in. maximum, which was originally used in District I (Eureka), and also a 3/8-in. maximum. From my own experience, I do not believe that the 3/8-in. maximum should be placed as thin as 1/2-in. but, say, 5/8-in. to 3/4-in. thick.

The open-graded surface course gives a very pleasing surface and eliminates splash from tires during rainy weather, but it is far from a

## What California Means by Open-Graded

The 1960 specifications of the California Division of Highways require that mineral aggregate for open-graded mix must consist of broken stone, crushed gravel or both, with at least 90 percent fractured particles (California test No. 205). Gradation unless otherwise specified in special provisions must conform to the No. 3 maximum grading, as follows.

Sieve Sizes	Percentage Passing Sieves	
	3/4 in. Max.	No. 3 Max.
1/2 in.	100	—
3/4 in.	90-100	100
No. 3	—	85-100
No. 4	30-50	—
No. 8	15-32	15-32
No. 16	0-15	0-15
No. 200	0-3	0-3

Abrasion loss is limited to 37 percent maximum, under the Wet Shot Rattler test, 10 percent under the Los Angeles Rattler test (100 revolutions) and 40 percent (500 revolutions).

Film stripping characteristics are closely controlled, with a 25 percent maximum determination permitted under California test No. 302. Swell is also tested for the minus 4 fraction, with .030 in. maximum permitted under California test No. 305.



cure-all. The advantages and disadvantages that I can think of off-hand are:

#### Advantages

1. Eliminates most of the tire noise, resulting in a smooth, quiet ride.

2. Practically all of the compaction is obtained under the screed of the paving machine. For this reason the mix is very effective in smoothing up rough surfaces.

3. Rain water drains into the mix and this eliminates a lot of the splash which occurs under tires.

#### Disadvantages

1. The mix will not stand the action of tire chains and should not be used in an area where heavy snowfall is expected.

2. It is more susceptible to gasoline drippings, particularly in the first months after construction. For this reason it is not recommended for parking areas.

3. From my own observation, I feel it tends to peel off if placed on a deflecting or yielding pavement, and for this reason should not be used as a maintenance measure on structurally inadequate pavements.

4. There has also been some speculation about damage which might occur due to ice freezing in the void spaces of the mix, but I understand that an open-graded mix placed near Ely, Nevada, where these conditions occur, has performed very well.

5. Due to the open texture, the asphalt of the mix could be expected to harden more rapidly and the long time durability may not be good, particularly in the hotter climates.

In placing the open-graded material it is important that the mix temperatures be kept relatively low, usually not over 225° F. A fairly high asphalt content, of from 5 percent to 6 percent, is required, and if the mix temperature is too high the asphalt will drain off into the bottom of the truck and cause fat spots in the pavement. The mix must be placed in a thick enough layer to avoid dragging under the screed as any areas where dragging occurs tends to peel off under traffic. Because of this, it is usually advisable to use the same paver for placing the open-graded mix that was used for the dense-graded mix.

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## Job and Equipment Ideas

### Trench Cage Protected Workers

Trenching can be a hazardous operation, particularly when a narrow trench 15 to 23 ft. deep is involved. Knowing this from experience, the personnel of Ben Construction Co., Pittsburgh, Pa., devised the steel framed cage here pictured. This cage came in mighty handy on the firm's \$340,000 sewer contract in the city of Rochester, Pa., near Pittsburgh.

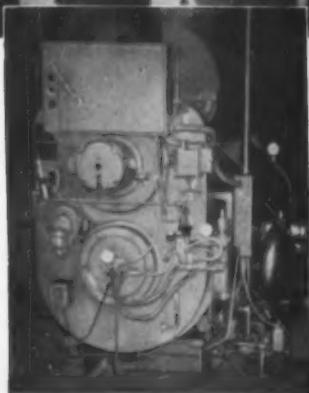
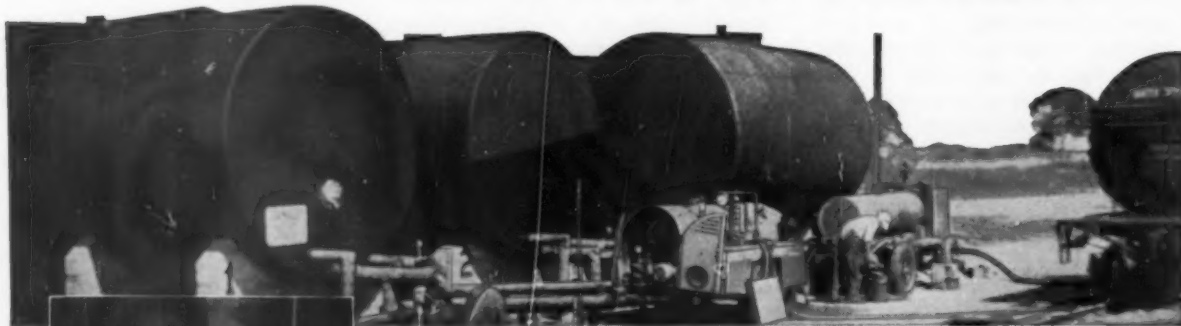
Over 16,000 lin. ft. of sewer lines in sizes down to house connectors was involved. Close proximity of railroad lines, with the attendant vibration, added to the hazard. The water table also was a cause of concern.

The prefab cage saved time and labor, as well as offering protection to workers in the trench, being used in places in lieu of timbers and shoring. The cage was readily handled by a crane.



Prefabricated safely cage for workers in trenches. (Photo courtesy Constructors Association of Western Pennsylvania.)

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### Cleaver-Brooks heaters keep 90,000 gallons on tap for Waupaca County (Wisconsin) Highway Department

Mr. Fred Grunwald, Highway Commissioner of Waupaca County, relies on two Cleaver-Brooks heaters to keep his asphalt road work flowing smoothly.

One, a Peak Temp heater rated at 2,000,000 Btu, heats 90,000 gallons of asphalt in seven tanks . . . keeps all grades of asphalt, from medium cure 0 to asphalt cement, hot and job-ready on a minute's notice.

The other, a PSM-50 portable steamer, raises tankcar loads to pumpable temperatures for unloading.

Mr. Grunwald reports: "With this

equipment, we have asphalt at the proper temperature — all we need, any time we want it."

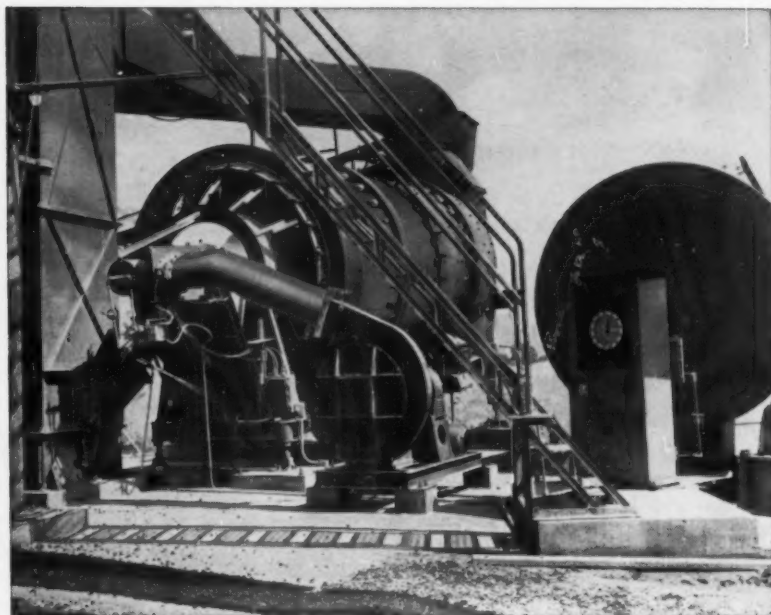
For more information, write to Cleaver-Brooks, Dept. P, 395 E. Keefe Ave., Milwaukee 12, Wisconsin.

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# NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.\*



Burner Controller

## Automatic Burner Controls

Automatic burner controls for all models of Barber-Greene aggregate dryers for asphalt mixing plants are now available.

The controls, which are recommended for all plants where the dryer is frequently operated on continuous runs, consist of electronic equipment which continuously measures and records the temperature of the aggregate being discharged from the dryer and automatically makes the necessary burner control adjustments to maintain the temperature within pre-set limits. Also, a combustion safeguard unit shuts off the fuel supply to the main burner if the pilot flame is not operating during start-up and shuts down the entire burner in case of main flame failure.

Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.

For more details circle 101 on Enclosed Return Postal Card.

## New Hitching System

An automatic hitching system that provides tractor operators with a means of coupling onto equipment without leaving their tractor seat has been announced by the Powell Pressed Steel Co.

The design principle of the system, called Insta-Hitch, is two triangular frames, one nesting inside the other. The outer frame (female) is attached to the various equipments to be used, the inner frame (male) is attached to the tractor. A guide hook is po-

sitioned at the apex of the triangle of the inner frame making the primary engagement for the two frame surfaces. The triangular shape assures positive alignment, leveling and positioning, the manufacturer states.

Powell Pressed Steel Co., Hubbard, Ohio

For more details circle 102 on Enclosed Return Postal Card.

## Ore Carrier

A newly developed ore carrier that is powered by a 75 hp diesel engine, and is equipped with automatic transmission to handle its four forward and four reverse speeds, has been introduced by Getman Bros.

The carrier is 15-ft. 6-in. long and has an overall width of 77-in. It can



Getman's Ore Carrier

carry loads of five tons at speeds up to 15 mph. The four-wheel brakes are air over hydraulic.

Getman Bros., South Haven, Mich.

For more details circle 104 on Enclosed Return Postal Card.



"Insta-Hitch" System

## Ice Melter

A ice and snow melting compound that contains Xylo-Phosite to increase melting and penetrating effectiveness, has been announced by The Monroe Co.

One pound of the compound has bored half-way through a 10-lb. block of ice in 10-min. It reportedly leaves no residue, is harmless to concrete, shrubs and grass, and retards re-freezing.

The Monroe Co., 10708 Quebec Ave., Cleveland 6, Ohio

For more details circle 103 on Enclosed Return Postal Card.

\*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.



## 40-Ft. High-Lift

A new model of their High-Lift Loader, designed to carry a 3,000-lb. load to a height of 4-ft., has been announced by the Lull Engineering Co., Inc.

Design improvements in the new unit are a frame made of high carbon steel, seamless steel tube stress mem-



High Life (lifting hod buggies)



High Lift (extended)

bers on each side of the machine to prevent longitudinal twisting or swaying of the machine, longer and larger capacity ballast box and heavier permanent rear bumper which acts as a rear cross member of the frame and also gives additional ballast, and a new rear box frame cross member behind the engine for additional stability and stiffening at the point where the transverse tower pivots on the main frame.

Lull Engineering Co., Inc., 3045 Hwy. 13, St. Paul 11, Minn.

For more details circle 105 on Enclosed Return Postal Card.

## Asphalt Coating

An epoxy-fortified thermal plastic coating, called Driveway Magic, has been introduced by Driveway Magic Chemical Company.

The product has been developed for use on either asphalt or rough concrete. Traffic marking paint or lacquer

can be applied over the product. The product seals in bonding elements of asphalt, comes in five colors and can be applied with an ordinary bristle push broom.

Driveway Magic Chemical Co., 3951 Medford St., Los Angeles 63, Calif.

For more details circle 106 on Enclosed Return Postal Card.

## Prevent Cement Burns

A protective barrier cream, called Kerodex No. 71, that prevents alkali burns from wet cement handling and dry cement dust in the atmosphere, has been introduced by Ayerst Laboratories.

The product is a greaseless cream that, according to the manufacturer, will not affect the skin and is waterproof. Workers exposed to the corrosive alkalinity of wet cement apply the cream to hands, wrists and forearms. Those working in areas with dry powder suspensions in the air apply it also to face, neck and ankles. The cream prevents the dermatitis, irritation and burning caused by cement alkali and plastering compounds.

Ayerst Laboratories, 685 Third Ave., New York 17, N.Y.

For more details circle 107 on Enclosed Return Postal Card.

## Vibrator Rollers

The Asphalt Equipment Co. has been appointed national distributors for Scheid Vibratory Tandem Rollers.

The equipment is manufactured in West Germany and comes in three



Model 25 Tandem Roller

models; Model 21 compacts with water at 1½ tons as a static roller, and with vibration compacts with a force of from 6 to 8 tons depending on the material; Model 20 operates with ballast at 2½ tons and, with vibration, at 10 to 12 tons; Model 25 works at 5½ tons with ballast and at 25 to 30 tons with vibration.

Asphalt Equipment Co., 3314 Cherry Le., Fort Wayne, Ind.

For more details circle 108 on Enclosed Return Postal Card.

## Wagon-Mounted Crane

A self-propelled H-5 Wagon Mounted Crane that reportedly offers close-quarter mobility, and is designed for their H-5 Hydrocrane, a 12-ton, ½-yd. crane excavator, has been announced by Bucyrus-Erie.

Rear wheel, hydraulic steering gives the machine a turning radius of 22-ft. It has a 110-in wheelbase, an over-



H-5 Wagon-Mounted Crane

all length of 35-ft. with the standard two-piece boom in a retracted position, and a 9-ft. width with outriggers retracted. Outrigger housings are built into the wagon's body. A Clark planetary driving axle provides a 22.35 to 1 gear ratio. The machine is driven by a six-cylinder gasoline engine with a transmission that provides three speeds forward and one in reverse.

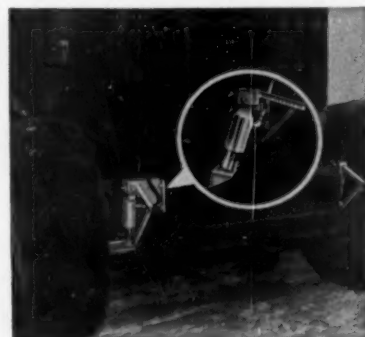
Bucyrus-Erie Co., 1046 Monroe St., So. Milwaukee, Wisc.

For more details circle 109 on Enclosed Return Postal Card.

## Grader Stabilizer

A tandem axle motor grader stabilizer that is designed to offset the torque of the power train that pulls the front wheel down and raises the rear wheel, decreasing traction, has been developed by A. W. Schnuerle Mfg. Co.

The manufacturer reports that traction is improved up to 42 percent by attaching this device, and that grade



Grader Stabilizer

line, rideability, and uniform depth of laydown is improved.

A. W. Schnuerle Mfg. Co., Aberdeen, So. Dak.

For more details circle 110 on Enclosed Return Postal Card.





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Name \_\_\_\_\_ Title \_\_\_\_\_

Firm or Gov't. Dept. \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ 12-61

NOT GOOD AFTER JANUARY 15, 1962

## Ditch Filler

The IMCO Ditch Filler attachment, with six heat-treated srafer shanks, has been announced by Independent Mfg. Co., Inc.

The attachment has two 15-in. high



**IMCO Ditch Filler**

mouldboards curved and pitched to roll the dirt into the trench. Replaceable H&L points break up the dirt and take side drafts. The shanks are adjustable so they can be used for scarifying only, if desired.

Independent Mfg. Co., Inc., Neodesha, Kans.

For more details circle 111 on  
Enclosed Return Postal Card.

## 9-Ft. Long Loader

A new loader that is nine feet long, including the scoop, has been announced by Melroe Mfg. Co.

Called the Bobcat, the loader has four-wheel drive, and has no transmission or differential. It has doubleacting lift and tilt cylinders which are



**The Bobcat**

hydraulically powered. It has direct drive that is permanently lubricated and sealed against dust. It can be transported in a small truck.

Melroe Mfg. Co., Gwinner, No. Dak.

For more details circle 112 on  
Enclosed Return Postal Card.

## Utility Trencher

A utility trencher, the W-36, has been introduced by Davis Mfg., Inc.

The unit is powered by a 6-hp Briggs & Stratton engine and is self-propelled by a six-speed winch drive. It trenches from 6-in. to 3-in. wide to a maximum depth of 36-in. deep and will operate at speeds up to 500-ft. per hr. It has a built-in protective torque limiter that disengages when a shock load is encountered, then re-engages immediately to continue digging. A feature of the trencher is its self-transporting drive. By pulling a lever,



**Self-Propelled Trencher**

a friction wheel engages the rear tire and the machine moves to a new trenching site or to its carrier at speeds up to 4.5 mph.

Davis Mfg., Inc., 1500 S. McLean Blvd., Wichita 13, Ka.

For more details circle 113 on  
Enclosed Return Postal Card.

## Mixer Drum Control

A new truck mixer drum control that provides control of discharge by one man at the end of the mixer



**The Rex Control**

chute has been announced by Chain Belt Co.

The control, named Rex Control, can be fastened either to a section of the chute or, for long distance pours, can be operated via a flexible remote air line stretching up to 30-ft. The control is air-operated, drawing air from the truck's air brake system.

Chain Belt Co., Construction Mach. Section, 4644 W. Greenfield Ave., Milwaukee 1, Wisc.

For more details circle 114 on  
Enclosed Return Postal Card.

## New Tandem Axle

A 24,000-lb. capacity tandem axle, the Tilt-Top, has been added to the line of Miller Tilt-Top Trailer, Inc.

The new model features a straight-thru tongue on which running gear



**24,000-Lb. Tandem Axle**

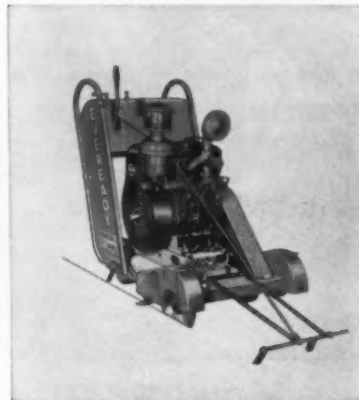
is suspended on a tongue-frame instead of the platform. Suspending tandem wheels permits a tilt platform pivot point to the rear of center so that the tilted platform can swing over the rear wheels without a "beaver-tail" hump. The over-the-wheels platform is 8-ft. x 16-ft. and decked with oak. A hydraulic cushioning device is standard equipment.

Miller Tilt-Top Trailer, Inc., 486 S. 92nd St., Milwaukee 14, Wisc.

For more details circle 115 on  
Enclosed Return Postal Card.

## 18 hp Concrete Saw

The Model E-18, concrete saw introduced by Eveready BrikSaw Co., is powered by an air-cooled Wisconsin engine and features Tri-Matic Blade Alignment for vertical plane cutting



**The Eveready Concrete Saw**

on all surfaces.

This saw also features Hydra-Eze control which automatically feeds the blade into the cut, then lifts the blade out of each cut when finished. One man can operate this saw. The dual blade shaft permits the blade to be used on either side of the saw.

Eveready BrikSaw Co., 1104 Union Ave., Dept. 598, Kansas City 1, Mo.

For more details circle 116 on  
Enclosed Return Postal Card.



8,000-Gal. Water-Master

### Water Distributor

A new water distribution unit, the Water-Master, is now being offered by the Shepherd Machinery Co.

The unit is nominally rated at 8,000 to 8,500 gal. capacity, but can be adapted to other requirements. It can be constructed integral with the standard tractor unit, gooseneck and rear scraper suspension of Cat DW20, DW 21, or LeTourneau Model B units. The water distribution system employs a hydraulically actuated pump

on the DW units; and electric pump on the B models. Adjustable spray head openings give capacities to the unit ranging from 670 to 1,500 gpm. Travel speeds on the DW20 range from 3.7 mph to 34.1 mph and on the DW21 from 2.9 to 26.6 mph. The B models range from 2.4 to 28.4 mph.

Shepherd Machinery Co., 3400 S. San Gabriel River Pkwy., Los Angeles 22, Calif.

For more details circle 117 on Enclosed Return Postal Card.

### Cleat-Top Conveyor Belt

A conveyor belt with molded pocket ribs and dams to prevent spreading of load on its top side, has been de-



Cleat-Top Belt

veloped by Hewitt-Robins.

Called the Cleat-Top Belt, it has a 30-in. wide belt that is 265-ft. long, and handles materials on a 18-deg.-20-ft. inclined conveyor at 250 fpm belt speed. The belt can rise as high as 21-deg. without the slipback encountered with smooth-cover belts, the manufacturer states.

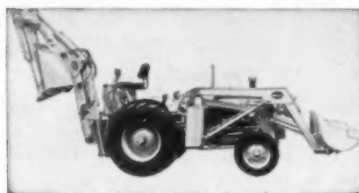
Hewitt-Robins, 664 Glenbrook Rd., Stamford, Conn.

For more details circle 118 on Enclosed Return Postal Card.

### Loader & Hydro-Trencher

Ware Machine Works, Inc. has engineered exclusively for the Oliver 550 Tractor the 561 Industrial Loader, and the Model 400 Tydro-Trencher.

The loader features a 60-in. bucket with a 34-deg. breakout. It has a 7,200-lb. breakout capacity, and rated lift of 3,800-lb. to full height. The trencher features a quick detach system, a digging reach of 18-ft. 4½-in. from center line of rear axle, breakout capacity of



Oliver 550 w/Equipment

10,500-lb., digging depths of 12-ft. 3½-in., 180-deg. uninterrupted swing and lifts to 5,400-lb. at 5-ft. radius.

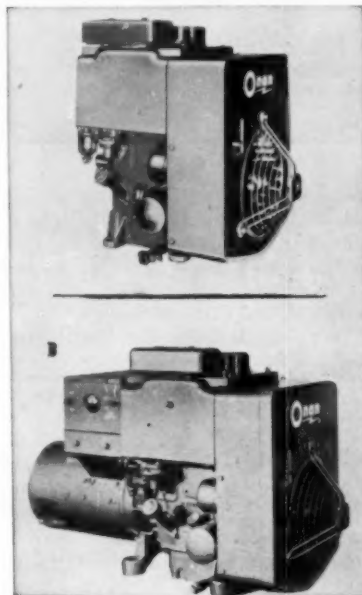
Ware Machine Works, Inc., Ware, Mass.

For more details circle 119 on Enclosed Return Postal Card.

### New Small Engine Series

A new series of engines and generators, designated the "J" Series, and featuring 1, 2, 4-cylinder; 4 cycle; and overhead valves has been announced by Onan, Division of Studebaker-Packard.

Some of the features in the new engines include: air-cooling; diesel power; full flow oil filter; no built-up relay on static exciter; stellite-faced valves that are made free to rotate; and 46 others. The entire line has 12



Onan Model J-60

Onan Model 5JB-1R

basic engines and matching generators. One design feature is the accessibility of all parts for servicing on one side of an engine, reducing downtime and lowering cost of maintenance and repairs.

Onan, Div. of Studebaker-Packard Corp., 2515 University Ave., SE, Minneapolis 14, Minn.

For more details circle 120 on Enclosed Return Postal Card.

### Track Roller Rims

Deep-hardened, forged steel rims for the track carrier rollers of Cat D9 and D8 tractors and Cat 583 pipe-layers are now available from the manufacturer, Caterpillar Tractor Co.

The new units have surface hardness of Rockwell C 56. Hardness at a depth of almost 3/16 of an inch is Rockwell C 50.

Caterpillar Tractor Co., Peoria, Ill.

For more details circle 121 on Enclosed Return Postal Card.

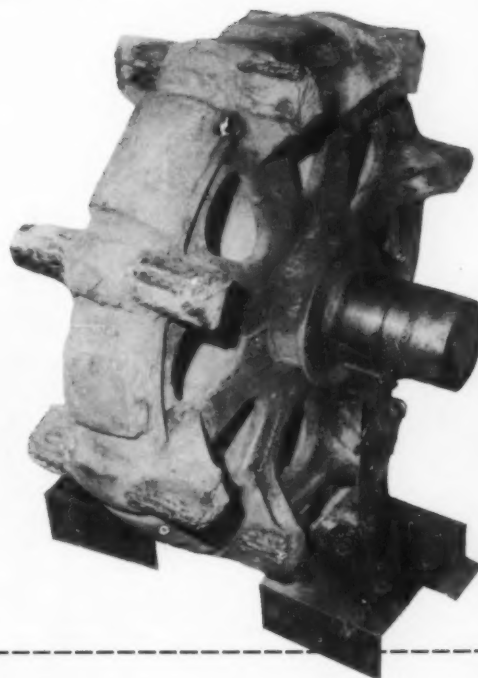


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available  
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Electrode...*

# STOODY 1105

For the company maintenance shop desiring to rebuild its own heavy machinery undercarriage parts, but not having sufficient rolling stock to warrant the installation of automatic welding equipment... *here is the ideal electrode.* Providing the same deposit properties as the widely used Stoody 105 automatic hard surfacing wire, Stoody 1105 may be used for hard-facing tractor rollers and idlers, arch wheels, shovel rollers and idlers, charging car wheels and sprockets, as well as churn drills and other equipment subject to severe impact and abrasion and metal-to-metal wear.

*Literature describing STOODY 1105 is available. See your nearest STOODY DISTRIBUTOR (check the "Yellow Pages" in your phone book) or write direct.*



**STOODY COMPANY**

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# NOW...DISTINCTIVE COLOR FINISHES WITH MORE CORROSION RESISTANCE THAN MOST PRIMERS

This attractive bridge carries New Hampshire Route 3B over Interstate Highway 93 in the town of Northfield, New Hampshire. When completed last fall, the bridge was given, in addition to the shop coat, two coats of paint containing *M50* Basic Lead Silico Chromate—the remarkable pigment that not only offers top-notch primer protection in every coat, but also a range of tinting possibilities never before available in outdoor protective paints. Bright hues, soft pastels, matched “official” colors . . . *M50* Basic Lead Silico Chromate can be tinted to meet virtually any color requirement while providing

anti-corrosion protection all the way out from primer to finish and outstanding durability all the way in: from finish to primer. Weather resistance is outstanding.

We call *M50* Basic Lead Silico Chromate the “Defense-in-Depth” pigment. Today, paints pigmented with *M50* are “defending in depth”—and saving money—in states ranging from Maine to California. For details on how *M50* Basic Lead Silico Chromate can benefit you, write or call National Lead Company. We'll be glad to send you full information.



**M50**® an **oncor**® Pigment...  
A Development of

**National Lead Company**

General Offices: 111 Broadway, New York 6, N. Y.

... for more details circle 314 on enclosed return postal card

## Set-Retard Concrete

A new set-retarding agent that eases production of exposed aggregate concrete has been announced by Edick Laboratories.

The product, called Liquid Edick Surface Retarder, can be applied with brush, spray or roller to steel, wood or masonite forms, or freshly poured concrete surfaces. Set is delayed, but not killed, to a depth of 1/8-in. for about 24 hours, the manufacturer states. Retarded cement is then washed off with a hose to expose aggregates.

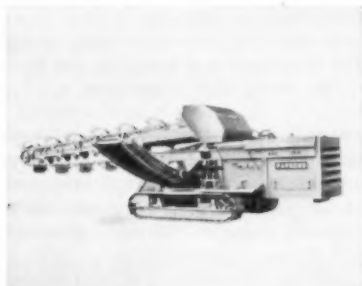
Edick Laboratories, Inc., 2358 S. Burrell St., Milwaukee, Wis.

For more details circle 122 on  
Enclosed Return Postal Card.

## Trenchliner

A ladder type trenchliner designed for cutting 18 to 48-in. trenches up to 15-ft. deep has been introduced by Parsons Co.

The new unit, designated the 255, is 9-ft. 2-in. in height and 7-ft. 10-in. wide. The manufacturer states that this size provides a low center of gravity for stability and close-quarter trenching. It has hydraulic actuation of steering and bucket line clutches. The machine has 60 digging feeds available with optional sprocket, from 3.9 to 140.2-in. per min.



The 255 Trenchliner

and three conveyor belt speeds: 277, 378 and 661-ft. per min. The tractor type crawlers have 16-in. wide shoes which reportedly result in a bearing area of 7.8 psi. It has a spring cushioned, cutting blade action bucket cleaner.

Parsons Co., P. O. Box 431, Newton, Iowa

For more details circle 123 on  
Enclosed Return Postal Card.

## Separating Equipment

The Model HFP Magnetic Drum Separator, designed to eliminate the problem of tiny particles of metal fouling delivery truck valves, has been introduced by Eriez Mfg. Co.

According to the manufacturer, the equipment removed over 66,000-lb. of tramp iron from granulated slag during the first six months of operation at a job site in Pennsylvania. Slag is

fed from a 45-ton, double storage bin by the manufacturer's dual-drive Vibratory Feeder. This feeding unit features a double-drive mechanism in order to move material along a long



Magnetic Drum Separator

96-in. feeding tray. The metal contaminated slag falls into the chute-type feed hopper of the magnetic drum separator. This unit reportedly separates 1-ton of metal from every 30 tons of slag processed. The special hopper chute prevents slag from plunging directly onto the face of the drum, minimizes drum wear and eliminates shell damage from falling tramp iron.

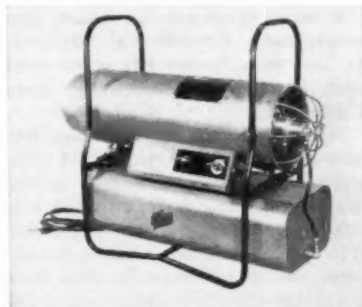
Eriez Manufacturing Co., 95 Magnet Dr., Erie 6, Pa.

For more details circle 124 on  
Enclosed Return Postal Card.

## Space Heater

A new space heater, portable and oil-fired, has been announced by Thor Power Tool Company.

The new heater is designed with a low pressure rotary type burner. Low



Thor Space Heater

pressure firing provides a .90-gal. fuel consumption per hour, permitting the heater to operate thirteen hours continuously at low fire. The burner atomizes fuel centrifugally. Maintenance is said to be minimal because there are no nozzles, no burner tips, no small orifices on the unit. It has a temperature control feature whereby 70,000 btu per hr., or any graduation between can be achieved by turning the dial from low to high. The unit weighs 42 lb., less fuel, has dimensions of 30 3/4-in. length, 13-in. width and 26 1/2-in. height.

Thor Power Tool Company, Aurora, Ill.

For more details circle 125 on  
Enclosed Return Postal Card.

## Battery Charger

A fully automatic charger for batteries used in light-duty industrial trucks, personnel carriers and other small electrically powered utility vehicles has been developed by Exide Industrial Storage Battery Co.

It has been designed to help get the best use out of 12, 24, or 36-volt lead-acid batteries used in light-duty application. Called the LDR (for Light-Duty Rectifier), the charger has TVR relay-timer charge control, does its job



The LDR Battery Charger

automatically after it is connected to battery and to a nominal 115-volt AC source. It is fan-cooled, fused, and is equipped with ammeter and an on-off switch as part of the timer. Silicon rectifying elements of the LDR charger directly convert alternating current to the direct current required for battery charging.

Exide Industrial Marketing Division, The Electric Storage Battery Co., Rising Sun and Adams Avenues, Philadelphia 20, Pa.

For more details circle 126 on  
Enclosed Return Postal Card.

## Plastic Safety Glove

A new glass gripper glove that is designed to provide additional safety in the handling of glass, tile, lumber, concrete block and sharp dry metals has been introduced by Advance Glove



The Plastic Glass Gripper Glove

Manufacturing Co.

A safety feature of the new glove is box-tip fingers. Curved to fit the finger, they are designed to provide comfort and protection. The pitch of the tip adds dexterity in handling smooth surfaces. The glove is not recommended for use with petroleum products.

Advance Glove Manufacturing Co., 901 W. LaFayette Blvd., Detroit 26, Mich.

For more details circle 127 on Enclosed Return Postal Card.

## Concrete Joint Maker

A wedge shaped piece of 30-gage Electro-Pointlok steel, hollow in the center, is what makes up the "Unitube" device for making joints in concrete.

The manufacturer, Middlestadt Corp., along with Republic Steel, who makes the steel used in the device, state that it can be installed while the concrete is fresh. The top of the wedge is  $\frac{3}{8}$ -in. wide and is installed with the top flush of the roadway.



Unitube Jointer

Depth is 2 to  $2\frac{1}{4}$ -in. for highway paving. The two sides of the wedge come together at the base and then curve up to provide hook-like anchors at each side. After the concrete has cured, the device is crimped or folded down into itself, leaving a  $\frac{1}{2}$ -in deep slot which is then easily sealed. The top section of the wedge remains fixed in place, and a mechanical seal is provided to hold the  $\frac{1}{2}$ -in deep sealer up. The device is designed to eliminate the "thump" in highway driving.

Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, Ohio

For more details circle 128 on Enclosed Return Postal Card.

## Measuring Tape

A new type of metallic and non-metallic measuring tape has been announced by B. G. Reilly Co.

The metal type has eight fine gauge copper wires woven into the linen base. The non-metal one is without copper wires, making it more readily useful where electrical hazards might exist.



Measuring Tape

Tapes are in leather cases with winding mechanism of polished brass. Plastic coating protects the tape line against moistures, and can be cleaned with damp cloth. First three feet of the tape are reinforced with a plastic.

B. G. Reilly Co., P. O. Box 231, No. Scituate, R. I.

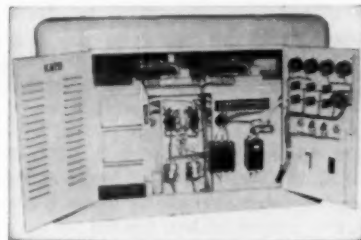
For more details circle 129 on Enclosed Return Postal Card.

## AC, DC Motor-Generator

A motor-generator set which can supply both 120/208-volt, 400 cycle AC and 20 to 30-volt DC at the same time, has been introduced by Kato Engineering.

Input is provided by a 20 hp, 550-volts AC, 3-phase, 60 cycles, 1714 rpm, squirrel cage type induction motor. Output generator is 10 kw, 12.5 kva, 120/208 volts AC, 3-phase, 400 cycles, 1714 rpm, with a direct connected exciter. Also, mounted on the same shaft is a 2 kw, 20 to 30-volt, 100-amp DC generator. The fully housed unit is

mounted on a skid type base. A static regulator on both the AC and DC generators is capable of voltage regu-



Motor-Generator

lation of 2 percent from no load to full load. Harmonics are under 5 percent.

Kato Engineering Co., Mankato, Minn.

For more details circle 130 on Enclosed Return Postal Card.

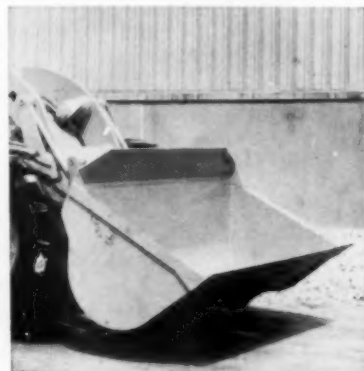
## New Buckets

Nine new general application buckets are now available for Cat wheel-type loader, according to the manufacturer, Caterpillar Tractor Co.

The buckets incorporate new extended cutting edges. Also, the edges are self-sharpening. Cast steel corner pieces are welded both to the cutting edge and to the bucket. Holes for mounting bucket teeth adapters are pre-drilled in buckets of the types normally used for excavation work. The five types now available for each of the three Cat-wheel-type loaders are:

Standard Buckets, with wrap-around cutting edges for durability;

Light Material Buckets, designed to handle light, easily-loaded materials; Reduced Capacity Buckets, of stand-



Light Material Bucket

ard width and designed for loading heavier-than-average material; Narrow Width Buckets, for penetration in tightly packed materials and hard bank digging; Standard Width, Increased Capacity Buckets.

Caterpillar Tractor Co., Peoria, Ill.

For more details circle 131 on Enclosed Return Postal Card.



## Power Sweeper

The Starsweep model 1054, newest addition to the power sweeper line, has been announced by the Wayne Mfg. Co. The new unit incorporates many new features designed to provide efficient, safe and economical sweeper operation.

Some of the features are: 54-in. main broom sweeping swath; hydra-mechanical drive system and single foot con-



Wayne Starsweep

trol for forward and reverse travel. The steering is positive response, zero backlash, automotive-type pinion and sector gear.

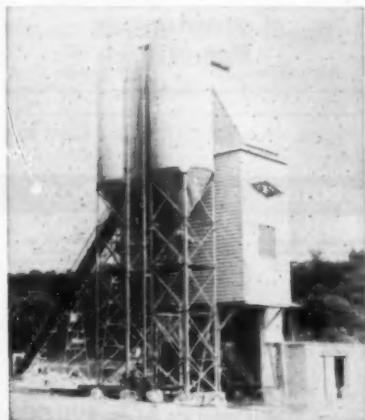
Wayne Mfg. Co., 1201 E. Lexington St., Pomona, Calif.

For more details circle 132 on Enclosed Return Postal Card.

## Ready-Mix Concrete Plant

A new, remotely operated ready-mix plant that produces rigid specification concrete automatically and electronically from pre-set formulas, has been introduced by the Noble Co.

The installation consists of an automatic batching plant that weighs all materials simultaneously and a central control station housing a remote, electronic batching console and graphic recorder. The push-button console operates the batching and dumping



Concrete Plant

cycles automatically. The console electronically adjusts quantity of sand and water to compensate for variation in percent of moisture to insure proper slump control. A recording instrument maintains a continuous record of the date, time of day, mix designs and individual weights of cement, aggregates and water for each batch.

Noble Co., 1860 7th St., Oakland, Calif.

For more details circle 133 on Enclosed Return Postal Card.

## Diaphragm Pumps

A new line of gas engine powered, diaphragm pumps which include both single and double diaphragm types has been announced by Rice Pump & Machine Co.

Capacities on the pumps range from 1,000 to 17,000 gph. Suction and discharge openings range from 2-in. single to 4-in. double. Swing and ball type valves are offered. The pumps have worm gear drive which provides one-step speed reduction. Other features



The Rice Double-Diaphragm Pump

are: bronze bushed banjo type eccentrics; clean-out ports on both suction and discharge sides.

Rice Pump & Machine Co., Belgium, Wisconsin

For more details circle 134 on Enclosed Return Postal Card.

## Dual-Tire Traction

A system whereby traction in snow, ice or mud can be achieved without jacking up or moving the vehicle has been introduced by The Tractioneer Co.

A driver can install this dual tire system, called Tractioneer, with a socket or lug wrench. According to the manufacturer, at normal speeds the unit is designed to give vibration-free running on or off the road. Specially formed spring steel traction plates fit over the dual tires and are bolted to a connector which is permanently installed in the wheel spacer. The traction plates are securely



Tractioneer

fastened to the tread of the tires. Removing the units requires only disengaging the connector bolts.

The Tractioneer Co., 460 Wrigley Bldg., 410 N. Michigan Ave., Chicago 11, Ill.

For more details circle 135 on Enclosed Return Postal Card.

## Face Shield Clip-On

A new headgear that adapts to shields, welding helmets and goggles so they can be attached to safety caps, has been introduced by Willson Products.

Called Kwik-Klip, the manufacturer states that the headgear will fit any known make of hard cap. The device has molded hooks which snap into position over the cap brim. The spring tension at the back of the head-



The Kwik-Klip

gear holds the shield to the cap. To remove, the hooks are spread and moved upward.

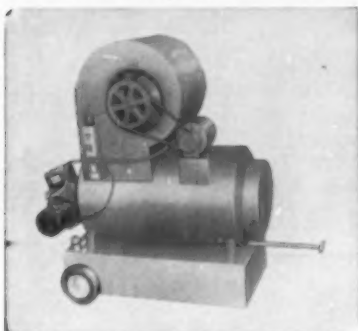
Willson Products, 567 Thorn St., Reading, Pa.

For more details circle 136 on Enclosed Return Postal Card.

### Contractor Heater

A new heater, called the Model 709, has been introduced to their line by Electronics, Inc.

The heat chamber of this new model is cylindrical in shape and utilizes a stainless steel combustion chamber. Heat is introduced to this chamber by the installation of a jet-type oil fired burner, and the unit is equipped with two electric motors. It is also available for operation with a gasoline engine. 1200 cu. ft. of air per min. is discharged through the unit via a



Model 709 Heater

Brundage blower. It delivers a heat output adjustable to any demand from 150,000 to better than 200,000 btu, the company reports.

Electronics, Inc., 101 E. Cherry St., Vermillion, So. Dakota.

For more details circle 148 on Enclosed Return Postal Card.

### Portable Floodlight

A lightweight emergency floodlight has been announced available by



Portable Floodlight

Stonco Electric Products Co.

The light is vaportight for use in all locations where excessive fumes, dust or water are damaging to fixtures. The unit is fully sealed and protected with heavy tempered-glass front lens and high-temperature silicone-rubber gaskets.

Stonco Electric Products Co., 333 Monroe Ave., Kenilworth, N.J.

For more details circle 149 on Enclosed Return Postal Card.

### Plastic Concrete Mold

A new, reusable plastic concrete cylinder mold is now available from Soiltest, Inc.

The mold, called the P-C-M, is made in two half sections of non-absorbent plastic material which is impervious to water. Two formed aluminum clamps hold the mold together and maintain a water-tight seal at the seams. Specially designed ribs at the one-third and two-third marks help control accurate filling for tamping in accordance with ASTM test specifications. According to the manufacturer, it will not dent or change size when filled with concrete.



Plastic Concrete Mold

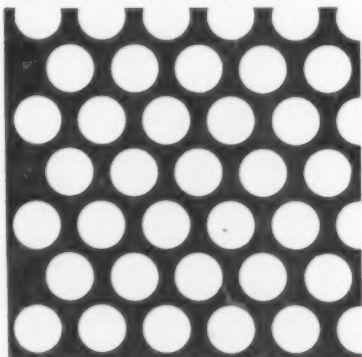
The mold may be used on the job-site or in the laboratory to prepare 6-in. x 12-in. concrete cylinders.

Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

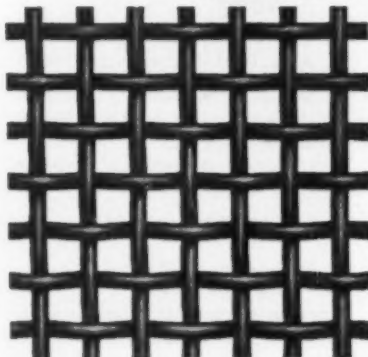
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New Products  
Continue on  
Page 105.

### ROTARY SWEEPER BROOMS

WE MANUFACTURE



Up  
COCOA ROLLER MATS  
Drag Broom Levelers  
Street Push-Concrete  
KENNEDY'S Brooms  
FILLING BUILDING  
PAIRS

VAN BRUSH MFG. CO.

2728 McGee Trlwy. Kansas City, Mo.

## FOR SALE

**MANITOWOC 1957, Serial No. 4700 Series** with 160 ft. boom, 30 ft. jib, Cummins V-12 diesel. This machine equipped for crane lifting, boom power up and down. Hydraulic boom snubs. Also included is clamshell and dragline equipment. This machine is 90% new.

**MANITOWOC 3900-B, Serial No. 39000 Series**, with 140 ft. boom, 30m ft. jib, Cummins power. This machine has independent swing and all other equipment similar to the 4500.

**71-B, 1956 dragline**, excellent condition, 90 ft. boom, 3 1/2 yd. drag bucket.

**71-B Shovel, 1959 model**, std. tracks.

**Lima 1250, 1958 model**, used 2 years, G.M. 6-110 power, 80 ft. boom, drag bucket.

**Link-Belt 608L, 9 roller frame**, Cummins power with torcon converter, 90 ft. boom, 1958 machine, few hours.

**Kochring 445-A-45 ton, 1960 model**, 8 x 4 drive, 100 ft. boom, 30 ft. jib, like new, priced right. **American 25 ton BT-375**, 60 ft. boom, 15 ft. jib. **Link-Belt HC88, 25 ton**, 80 ft. boom, 20 ft. jib, 1958 model, always on steel erection.

**Link-Belt, 15 ton, 5 yrs. old**, 60 ft. boom.

**McKiernan-Terry Model D.E. 40 diesel**, hammer and leads, like new.

**2 - T824 Euclid scrapers**, excellent throughout, tires 80% new.

**Bros Self propelled compactor**, 50 ton.

**Michigan model 280 dozer**, 1959.

**Pioneer Scrubber, model 1955, 14' x 6'**, complete with drive motor.

**Jaw Crusher, 22 x 36**, completely rebuilt, new bearings and new jaws.

**1-88-B. Bucyrus Dragline**. Excellent condition.

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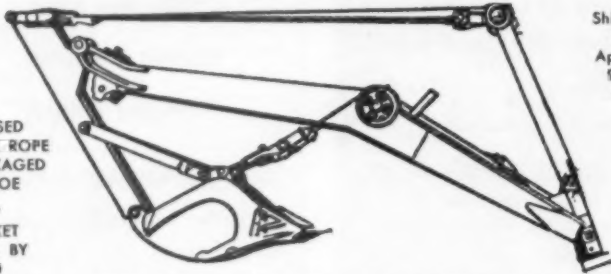
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- 1 - Fleco Clearing Rake.
- 1 - Loggers Cab.

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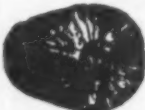
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### DRAGLINES - SHOVELS - CRANES

All Makes and Models,  
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## NEW and Guaranteed REBUILT ENGINES

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70% OF NEW PRICE

50 Ton, 3 Comp. Agg. Bin  
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3 Cu. Yd. Tilting Mixer  
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 Automatic Control Panel  
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2 Model D' Pulls  
 2 Model C' Pulls  
 1 Cat DW-10 & Scraper  
 9 Crawler Tractors, TD-24, D8 on down.

Harold Galbraith

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Save \$500 per set

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1 - 40 link Set Cat #1550 \$700

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F.O.B. East Hartford, Conn.

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Save 50 to 80%

GAS and Diesel . . . Have your Cylinder heads rebuilt. Preheated and gas welded, machine complete, ready to install. Factory guarantee. Exchange service on popular models.

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D-8 - S/N 8R663 \$5200.00  
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 Asplundh Brush Chipper - Like new, used only 62 actual hrs. S/N TC-2703-D3159 4200.00

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10—Model DW20 Caterpillar Pneumatic Tired Tractors with modified cat. 456 Scrapers.  
These are 67C series serials.

Old Price .....\$27,000.00 Ea.  
Revised Price .....\$19,800.00 Ea.

Above prices are F.O.B. Redding, California

10—Model DW20 Caterpillar Pneumatic Tired Tractors with modified cat. 456 P Scrapers.  
These are 88E series serials.

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Revised Price .....\$23,750.00 Ea.

These 88E Series are F.O.B. Oroville, California

**FINANCING AVAILABLE TO USERS**

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### "LIQUIDATING THREE LARGE MINES"

2-American Pulverizers, 30x28; 1-40"x22" Diamond rolls crusher; 3-24x36, McNally double roll crushers; 1-McClanahan & Stone, 24x42; 2-McNally, 60x36; 1-McNally, 36x48; 1-Rogers, 24"x20" jaw crusher; 1-Cedar Rapids, 24"x18" jaw crusher; 1-Diamond, 20"x36" jaw crusher; 1-McClanahan, 24x20, double roll; 2-sets Fairbanks-Morse, 24" long, 20 ton capacity; 1-set track scales, 20' long; 2-sets American, 20' long, 20 ton; 1-set Fairbanks-Morse, railroad scales (new) 200,000 lb., 49' long; 2-sets Winslow scales, 25", 25 ton and 45 ton; 2-sets Fairbanks-Morse, 40" long, 50 ton; 2-Hardsog, vertical drills; 1-Horizontal electric, highwall drill; 1-McCarthy, highwall drill, horizontal; 3-Joy, TM-350 wagon drills; 1-group Joy, Cleveland and Ingersoll Rand jack hammers; 1-5'x8 1/2" Tube mill (Sillex lined); 1-78" Wemco single screw double flange classifier; 2-Reinveid centrifugal dryers; 1-54" Adkins Classifier, single screw; 3-O. R. C. fine coal washers, 15 T. P. H.; 1-Band Washer (6"x12"x3") 1/2" plate; 1-Syntron F vibrator feeder 330T; 1-O. R. C. fine coal washer, 3 coll 32"x42"; 1-shaft tipple complete; 1-Worthington, 105 cu. ft.; 1-No. 125 Jaeger compressor; 1-Le Roi compressor, 500 cu. ft.; 1-Sullivan, Model WK60, 105 cfm; 1-Ingersoll Rand, 315 cfm; 1-Gardner Denver, 365 cfm; 2-Hewitt Robbins, Elliptex, 5x14; 1-Link belt, 6x16, triple deck; 1-4"x10", 2-deck Gyroset screen; 1-Nordberg, 3x12, double deck; 1-Simplicity, 4x6, double deck; 1-4"x8" 2-deck Diamond vibrating screen; 1-Hewitt Robbins, 6x16, single deck; 2-42"x96" Universal vibrating screens 2-deck; 1-Simplicity, 3x10, single deck; 1200'-30" belt (used) 5 ply, 32 oz. 1/2"x1/16"; 30' conveyors-90'; 75'; 24' conveyors-62 1/2'; 80', 57', 100', 73', 21', 39', 51', 48', 30', 32'; 36' conveyors-101', 14', 82', 20'; 15'-Natura Frequency conveyor; 60'-Bucket elevator, 8"x10"x8" buckets; 20'-Bucket elevator, 60x6 buckets; 2-Murphy diesel engines, Model No. 220 & 224; 1-218H scraper, less tractor; 1-S-12 Euclid scraper; 1-S-18 Euclid scraper; 1-No. 70 Cat. scraper; 1-Model 12 Cat. scraper; 1-TL-25 Lorain shovel, 1/2 yard; 1-Marion, 40A shovel; 2-Lima, 1/2 and 1 yd.; 1-Lima, Model 808 shovel; 2-750B shovels, electric; 3-P&H, 255A, 655B & 70U; 1-Northwest, 80D; 1-3W dragline, 80' boom; 1-10W Dragline; 1-93M, Marion, 3 1/2 yd. bucket; 1-3W, Bucyrus, electric, 75' boom, 3 yd.; 2-200W Bucyrus draglines, 125' booms, 6-8 cu. yard; 2-D-8's with two cash Gardner-Denver drifters; 1-D-4 tractor; 1-D-4 Cat. front end Loader; 1-D-8 tractor with 2 Le Roi drills and 600 CFM compressor; 2-HD-21 tractor; 1-Barber Green, yard bucket loader; 2-Haise, yard loader; 1-Compton Auger, Model No. 56; 1-Mack truck and low-boy; 1-3 1/2 yd. Amec drag bucket; 1-6" Jaeger pump; 4-Austin-Western, 10 ton, trail cars; 1-Ferguson, 50 ton roller; 2-Smith concrete mixers; 3-Eash Corrugated tunnel liner silos 16"x30"; 1-Each Corrugated tunnel liner silos 20' x 26'; 2-10,000 gal. oil storage tanks; 3-800 gal. steel tanks; 1-group of 5 to 75 HP speed reducers; Transformers—any size and make; Large group of motors and speed reducers; All sizes wire and cable; Pumps of any size and make; Large group of hoist; Any size rail and accessories.

MINE EQUIPMENT & SUPPLY COMPANY  
TA-1-2644, Madisonville, Kentucky TA-1-2646

## FOR SALE

Two LIMA Truck Cranes, Type 44T, 30 Ton, recent models, excellent condition.

One BUCYRUS-ERIE 51-B diesel Shovel.

Two BUCYRUS-ERIE 54-B diesel Shovels.

Group of Seven EUCLID 8TD Rear Dump Units with 56BY Bodies, 16 Cubic Yards.

REX Pumpcrete Machine Model 160-S, with assortment of 6" pipe and miscellaneous fittings.

Roads and Streets  
22 West Maple Street  
Chicago 10, Illinois  
Box 1242

## WAYNE SWEEPER

Model 450-1 - S/N 645 - Built 1951.  
Power - Chrysler Industrial gas engine.  
Engine completely rebuilt. Equipped with one Cutter Broom, one Pick-up Broom, 170 gal. Water Tank, 3 cu. yd. Hopper, 7 ft. 6 in. Sweeping Swath. Re-equipped with New Brooms.

Price \$4,950.00

ACTUAL PHOTO OF SAME ON REQUEST

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for changeable copy  
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Greenwood 4-5471

### • EUCLID Scrapers

S-18 Euclid Scrapers with 27.00x33 Tires.  
Ready-To-Roll Condition & Priced To  
Make You Money.

### • CEDARAPIDS Crusher & Scalping Unit

18 x 36 In. Jaw Crusher - 48" x 10' Double-Deck Screen, Driven by Allis-Chalmers Electric Motor or Arranged for V-Belt Drive from Flywheel. Under Crusher Conveyor - 30" x 25'6" - Driven by 5-hp Cedarapids Motor in Head Pulley. Unit Mounted on Tandem-Axle Assembly, with Eight 9.00 x 20 Tires. Can be Had with Cat D13000 Power. This Rig is Only 3 Years Old, Has Been Used Sparingly, and is in EXCELLENT CONDITION.

### • PIONEER Triple-Roll Secondary Unit

Tandem Truck-Mounted on Eight 11.00 x 20 Tires, 40 x 22 In. Timken Bearing Roll Crusher with 4 x 10 Ft. 3 1/2 Deck Vibrating Screen, 30" x 42' Feeder Conveyor and 24" x 6' Return Conveyor. Working Condition.

### • GARDNER-DENVER Air Compressor

Model RP 600-D GM 6-71 Diesel-Driven Rotary Type, Both Engine and Compressor Completely Overhauled and Both in A-1 Condition.

### • SEAMAN Mixer

Model TP-84M Seaman Mixer Tiller Soil Stabilizer Powered by GM 4-71. Seaman Pumping Unit is 4" Gear-Type Asphalt Pump Driven by 4-Cylinder Ford Industrial, Front-End Mounted, with Tachometer and Rear-Mounted Spray Bars. Used Only 600 Hours. EXCELLENT CONDITION.

### • CATERPILLAR D318 Electric Set

220/440 V., 3-Ph., 1800-RPM, Continuous Rating 72.3 KW. Like-New Condition

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Southeast Construction Co., Inc.

Telephone: Jefferson 4-3310

Write: P. O. Box 16

PINE BLUFF, ARKANSAS

### 18 V PIONEER DUPLEX PORTABLE CRUSHING AND SCREENING PLANT

10" x 24" RB Jaw Crusher GMC Diesel  
24" x 18" RB Roll Crusher Pneumatic Tires  
30" x 8' 3 1/2" Deck Screen Excellent condition  
DARIEN CORP. 60 E. 42nd St., N.Y., N.Y.



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C.O.D.  
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PREMIUM QUALITY  
GUARANTEED — OEM  
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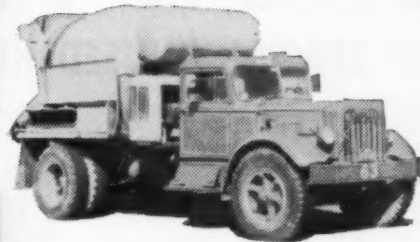
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PARTS CO.**

7306 BESSEMER  
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**10  
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**AUTOCAR and  
JAEGER MIXER  
PACKAGES**



ACTUAL PHOTO OF ONE MIXER-CARRIER PACKAGE

2—1947 Model C90	— 4x2 Trucks — 200" W.B. with 4½ yard mixers; Refer to #31-32	Net \$3000.00*
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1—1949 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #106	Net \$3000.00*
1—1950 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #102	Net \$2500.00*
1—1951 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #104	Net \$3000.00*
1—1951 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #103	Net \$2500.00*
1—1952 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #64	Net \$2500.00*
1—1952 Model C90	— 4x2 Truck — 182" W.B. with 6 yard mixer, Refer to #63	Net \$2500.00*

\*F.O.B. Boston, Mass.

## QUANTITY PRICE ON TEN PACKAGE PURCHASE



Write Crane Carrier Corporation, P. O. Box 5008, Tulsa, Oklahoma or dial LUTHER 3-5133 for further details.

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DRAGLINE & CLAMSHELL  
P & H Model 255A, ¾ yd., 45' boom w/ Drag & Clam Buckets.  
Michigan Model 175-A Tractor Shovel  
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CRANE  
Lorain Model L-25-K ¾ yd.

MOTOR GRADER  
Adams Model 412 H.

MOTOR GRADER  
Adams Model 512.

TANKER HEATER  
Littleford Model 115.

ROLLER  
Huber 10 ton 3 wheel with Cat Diesel Engine.

ROLLER  
Seamon-Andwold 17-wheel, 7 to 20 ton cap.

FINISHER  
Barber-Greene Model 879A.

ASPHALT PLANT  
Hub Portable, Model 25, cap. 10 tons per hour.

**DEEDS  
EQUIPMENT CO.**

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## EUCLIDS FOR SALE

Excellent Operating Condition

### 22-TON REAR DUMPS

FIVE - 46 TD's  
FIVE - 38TD's  
FIVE - 51TD's

TWIN ENGINE SCRAPER  
ONE TS-18 SPECIAL

**EUCLID DIV. G.M.C. -  
IRON RANGE BRANCH**

HIBBING, MINNESOTA  
Phone: AM 3-7507

120 yd. Johnson semi-automatic concrete batching plant (\$16,000); 3,500 sq. ft. Economy steel forms for concrete walls (\$5,000); 15,000 sq. ft. used Irvington standard all steel unit forms for concrete form work, excellent condition (\$7,000); Littleford Kwik steam generator for pile driving (\$5,000); Rome disc plowing harrow, model TMR 24-30 (\$1,800); 10 ton, 3 wheel Huber roller \$3,250; 2 6-inch Moretrench wellpoint pumps with 600 ft. pipe main system and all accessories (\$3,500); Northwest crawler crane; RN 12527 (\$17,500); P & H crawler crane, with shovel front and backhoe attachments, model 855-B, RN 10984 (\$15,500); 3 TD-24 bulldozers, RN 1914, 2024, 4266 (\$6,500 to \$8,000 each); contractor's field office trailers (\$1,000 to \$1,500 each); crane buckets, ¾ yd. to 2½ yd. (drag, clam and orange peel, etc. — various low prices); 2 - 1¼ yd. Multi-Pointe Pavers (\$2,500 each); Gallen Motor Grader (\$1,000); Adams motor grader (\$1,000); Cement bulk tank trailer (\$1,700); bulk cement car unloader (\$1,750); 2 - ¾ yd. Lorain shovel fronts (\$1,250 each); BAY CITY ¾ yd. shovel front (\$1,250); 1 - ¾ yd. Lorain backhoe (\$1,000); 2 - 2 yd. P & H shovel fronts (\$2,500 & \$3,000 each); 2 - 2 yd. P & H backhoes (\$1,500 & \$2,000 each) Scheidt Stone Grapple, type 0-3 (\$750); Federal No. 52A Sodmaster (\$375); Clipper concrete saw, model C20 (\$350); Cement Gunite machine (\$875).

Write P.O. Box 402 Phone Granite 6-4103  
BARRE, VERMONT

# SNOW PLOWS

## SPECIAL UNUSED KLAUER TU3

### CLIMAX PARTS

\$100,000

Inventory

25-75% off List

Model R-61 & R165

Complete Engines, Heads, Blocks, Connecting Rods, Crankshafts, Camshafts, Pistons, Accessories, Etc. - Also Klawer TU3 Parts.

### Specifications

#### TRUCK

FWD Mod. 367 - 7½ Ton, Motor Int. 501 Red Diamond, Power Steering, Cotta Aux. Transmission.

#### PLOW

Klawer TU3 Rotary PLOW.

#### ENGINE

Climax R165.

THIS UNIT HAS NEVER BEEN USED (NOT GOV'T SURPLUS)

REGULAR  
PRICE  
\$34,500.00

SALE PRICE \$22,500<sup>00</sup>

DELIVERED  
ANYWHERE  
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ALSO GOOD RECONDITIONED KLAUER TU-3 SNO-GO  
MOUNTED ON OSHKOSH 7½ TON 4 x 4... \$6,750.00

## WITTENBERG MOTOR CO.

2010 - 15th Ave. West - Seattle 99, Washington

Phone ATwater 2-1651

## 879A, 879B, SA 40, SA 60, & SB 60 SCREED PLATES & TAMPER BARS

### BIG SAVINGS

#### OVER 200 SATISFIED CUSTOMERS

Our plates are ½" thick made of high abrasion resistant Manganese Carbon Steel, machined flat and square. Bars are carburized and hardened to 58-60 Rockwell by a special process. Double wear for both. Check your Distributor Price. GUARANTEED satisfaction. F.O.B. Milwaukee, Wis. 2% 10-NET 30.

879A  
8-15" Bars—\$169.00  
2-12" Bars— 38.00

879B-SA 40  
SA 60-SB 60  
8-15" Bars—\$165.00  
2-12" Bars— 37.00

879A-879B  
SA 40-SA 60-SB 60  
2-5" Plates—\$432.00  
2-1" Plates— 107.00

Plate's Not Guaranteed if Overheated.

## CHASE ENGINEERING CO.

1751 N. 56th St.

Milwaukee 8, Wis.

SPring 1-3808

### PLANT

Ross Portable Plant, agg. & cement bins & batchers, one year old. Perfect.

### TRUCK MIXERS

Smith 5 - 6½ Yd., open end; on Mack B62 tandem, new 1955, 1000x20 tires, air brakes.  
Challenge 5 - 6½ Yd., open end; on GMC 400 tandem, 825x20 tires; rebuilt & perfect.  
Rex 5 - 6½ Yd., Chrysler; on White 2264 tandem, 10:00 tires, air brakes perfect.  
13 Other Units to Choose From.

### EIGHMY EQUIPMENT COMPANY

Pierpont at W. State St.

ROCKFORD, ILLINOIS

WO 4-6706

## GRAVEL PLANT EQUIPMENT

1—Austin and Western Portable Crushing and Screening Plant, with 940 Roller Bearing Jaw Crusher; 30x18 Roll Crusher; 2½ Deck 3x12' screen; Fred Hopper; Feeder; Recirculating Bucket Elevator and Conveyor; 30" Finished Product Conveyor, and International PA-100 Gas Engine.

1—Cedar Rapids, Portable Secondary Plant on Rubber, with 3x8' 1½ Deck Screen; 16x24 Roll Crusher; Elevator; Two 18" Recirculating Conveyors; Two 18" Finished Product Conveyors and Case Gas Engine.

2—20"x18" Eagle Portable Fine Material Screw Washers, Complete with Drives, less Wheels and Motor.

1—1½ to 2 Yd. Slack Line, 90 Ft. Sauerman Pole with Thomas Hoist, Complete with Blocks; 1½ Yd. Bucket; 100 HP, 440-Volt, Slip Ring Motor, Grids and Control.

1—1-Yd. Slack Line, 90 Ft. Sauerman Pole, Complete with Sauerman Hoist; Blocks; Cables; Trackline, and Bucket, less motor.

1—1½ Yd. Slack Line, 100 Ft. Sauerman Pole, Complete with Blocks, Cable, Trackline, two speed Hoist, and 150 hp, 440 volt, two speed motor.

## CONCRETE PLANT EQUIPMENT

1—1600 Bbl. Heltzel Cement Bin with Valves, scales and Batchers.

1—600 Bbl. Heltzel Cement Bin with valves, Batchers and Scales.

2—Grundler Belt Elevators, Complete with Belts; Drive; Motors and Electrical Starters and Disconnects; No. 5 American Pulley Speed Reducer; 26" Belt; 24" Material Buckets. Rated Cap. 100 TPH.

1—26" x 8-Ply Elevator Belt. 136' Long (new), ½ x 1/16 Covers, 36 oz. Not Punched.

1—Lot of new Belt (Short Lengths) 18' to 38'; 26" x 8-Ply. ½ x 1/16 Cover. 36 oz.

1—Steel Material (Cement) Elevator. Complete with Chain, Drive, Rated 50 TPH. 50' Centers.

For additional information write or call  
Mr. Charles W. Williams  
Montana 1-2711 or Ed Pitzer,  
Blackburn 1-1800

## HILLTOP Concrete Corporation

Westwood Station, Box 56  
Cincinnati 11, Ohio

## WHOLESALE PRICES TRACK CHAIN

### TO FIT:

Caterpillar - Allis-Chalmers  
International Crawler Tractors

### Weld-on Sprocket Rims

#### For:

Caterpillar  
Allis-Chalmers  
International

### LOWER ROLLERS

#### For:

All Models  
Crawler  
Tractors

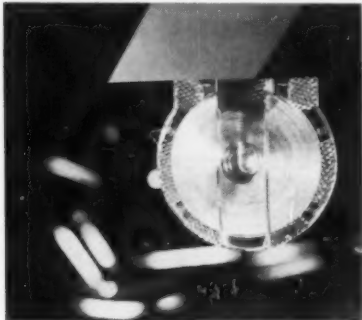
Please Specify Model of your Crawler Tractor When Writing for our Low Prices.

## Tupes of Saginaw, Inc.

Dept. "R" - 402 Davenport St.  
SAGINAW, MICHIGAN

## Warning Device

A battery-powered flasher whose light-blinks are transmitted through an amber-colored lens molded of Ten-



Safe-T-Flash

ite butyrate plastic, designed for warning on highways, streets and outdoor construction projects, has been introduced by Sigma Instruments, Inc.

Designated the Safe-T-Flash, the lens is 7-in. The battery case is enclosed in a steel housing and mounts on saw horses and barricades. The unit features a transistorized circuit.

Sigma Instruments, Inc., Fisher-Pierce Div., 170 Pearl St., South Braintree 85, Mass.

For more details circle 151 on Enclosed Return Postal Card.

## New Light Clamp

A clamp to attach a sealed beam weatherproof flood or spot light to any pole or pipe from 3/4-in. to 2-in. diameter, has been introduced by Natale Machine & Tool Co.

The clamp assembly permits full positioning of light beam regardless of stanchion angle or position. The



Light Clamp

entire assembly is water and corrosion resistant, states the manufacturer, and all exposed surfaces are cast aluminum with stainless steel hardware.

Natale Machine & Tool Co., Carlstadt, N.J.

For more details circle 152 on Enclosed Return Postal Card.

## Welder/Power Plant

Improvements in the AEA-200-L gasoline engine welder/power plant have been made by the manufacturer,



New Welder/Power Plant

Miller Electric Mfg. Co.

The unit is now driven by a 15 hp Onan air-cooled engine. Welder output is 250 amp—225 amp at 100 percent duty cycle. It provides 1 kw of DC while welding and, as a standby power plant, delivers 5kw of 115/230 v AC for running other appliances. The engine features twin mufflers, automatic spark advance and rotators on all valves.

Miller Electric Mfg. Co., 781 Bounds St., Appleton, Wisc.

For more details circle 153 on Enclosed Return Postal Card.



Snow removal is faster, more efficient with Monarch Power Hydraulic Controls on your vehicle. Lift and lower your snow plow right from the cab with a flick of the wrist. Instant up-and-down action . . . automatically! Quick installation. Thousands in use nationwide. See your dealer today. Free folder sent on request.

HY-LO JACK Fan Belt Driven DYNA-MIGHT Battery-Operated



MONARCH ROAD MACHINERY COMPANY  
1363 Michigan St., N.E., Grand Rapids 3, Mich. U.S.A.

... for more details circle 307 on enclosed return postal card

ROADS AND STREETS, December, 1961

Smart Squirrels are Stockpiling Now!

NOW'S THE TIME TO LAY IN

All-Weather, Instant-Use

**KOTAL**

Processed Bituminous

**STOCKPILE MIX**

FALL and WINTER  
PAVING and PATCHING

move faster and cost less, because Kotal Mix works easily in any weather, gives better, longer lasting results, is always available, stretches your repair period over entire 12 months, and requires no special tools or equipment. Check these seven reasons why Kotal processed, all weather bituminous mixes are preferred by engineers.

1. Durability
2. Stability
3. Toughness
4. Cohesiveness
5. Adhesiveness
6. Workability
7. Availability

Write for full details today.

**KOTAL Company**

119 SUMMIT AVE.  
SUMMIT, N. J.

... for more details circle 290 on enclosed return postal card

105



# Manufacturers' Literature

**MAINTENANCE EQUIPMENT:** An all-products brochure is now available from the Rowco Mfg. Co., Keene, New Hamp. giving complete specifications and prices, along with photographs, of their outdoor maintenance equipment.

Writeups include, the Model 660 portable powered brushcutter, the Trimkut power lawn trimmer, the Roll-king 500-lb. power roller, the Roll-king TD-1000 tandem riding 1000-lb. power roller and the Qwik-pik litter picker.

For more details circle 137 on  
Enclosed Return Postal Card.

**COMPACTION FILM:** A motion picture entitled, The Grid Roller, in sound and color and showing how the grid roller can turn pit run rock into stabilized crushed rock base or surface courses on the job, has been introduced by the Hyster Co., P.O. Box 4318, Portland 8, Ore.

The film was made at actual job sites in the Northwest and southern United States and northern Quebec. The construction of logging and haul roads, highways, access roads, and airport runways are depicted in the film.

For more details circle 138 on  
Enclosed Return Postal Card.

**LOADER & TRENCHER.** A 4-pg. bulletin describing their 561 Industrial Loader, and 400 Hydro-Trencher has been issued by Ware Machine Works, Inc.

Working specifications, overall-dimensions, hydraulic system specs and other important specification data is given on both machines. Also, features of each unit are pictured and discussed.

For more details circle 139 on  
Enclosed Return Postal Card.

## KANSAS CITY's Hospitality Hotel

- Downtown — Heart of Theatre, Shopping and Business District
- 10 Minutes from Airport, Railroad
- 350 Air Conditioned Rooms
- Garage Next Door—24 Hr. Service
- Year Round Swimming



**COLD WEATHER CONCRETING:** An 8½ x 11-in. placard written in earthy language, gives informative charts and artwork on the basic do's and don't's of cold weather concreting, as conceived by the Master Builders Co., Euclid & Thomas Aves., Cleveland 18, Ohio.

Data on use of accelerators, preparation of forms and subgrade for placing concrete, and protection and curing is included in the placard. On the back is a nomograph with which the temperature of mix water can be determined in order to obtain desired concrete temperature with aggregate and cement.

For more details circle 140 on  
Enclosed Return Postal Card.

**BATCH PLANTS:** A two-color, 16-pg. brochure describing the complete line of cement and aggregate batchers, has been made available by Erie Strayer Co., P.O. 1031, Erie, Pa.

The batchers, ranging in size from 14 to 70 cu. ft. capacities for cement, and from 1 to 10 cu. yd. capacities for aggregates, are designed for mobile, portable and stationary applications. The brochure presents information showing where weighing of batches by beam scales in applicable, and other pertinent material.

For more details circle 141 on  
Enclosed Return Postal Card.

**CEMENT GRINDING:** A leaflet describing the design and operation of the new D-O 270-deg. DSM screen, especially adapted for operation in grinding of cement raw mix, has been issued by Door-Oliver, Inc., 99 Have-meyer Le., Stamford, Conn.

When applied in the raw cement grinding circuit, the screen provides increased mill output and overall reduction in power consumption, according to the manufacturer.

For more details circle 142 on  
Enclosed Return Postal Card.

**WOUND ROTOR MOTORS:** The release of a new bulletin #104, dealing with wound rotor motors, was announced recently by Louis Allis Co., 427 E. Stewart St., Milwaukee, Wis.

Ranging in size from 1 to 30 hp., the literature reports that the motor is designed to meet the requirements of most wound rotor applications, including elevators, cranes, and hoists.

For more details circle 143 on  
Enclosed Return Postal Card.

**HOT MIX ASPHALT PLANT:** A new brochure on their "Black-Topper" hot mix asphalt plant has been announced by the Cutler Engineering Co., 5435 W. 63rd. St., Chicago 38, Ill.

The illustrated brochure gives a breakdown picture and writeup story on these plants. The dryer is 60-in. dia., and 10-ft. long on the No. 25 model plant, and 16-ft. long on the No. 40 model. The gradation unit has semi-automatic controls, and the unit tanks are fully automatic, oil heated with 6,930 and 10,350-gal. cap. respectively.

For more details circle 144 on  
Enclosed Return Postal Card.

**PORTABLE CRUSHING PLANT:** A catalog describing portable duplex crushing plants has been announced by Pioneer Engineering, Division of Poor & Co., Inc., 3200 Como Ave. SE, Minneapolis 14, Minn.

The "Productioneer" plants featuring a 15x36 jaw crusher, and 40x30 twin roll or 36-in. cone crusher, along with a 3-deck 5-ft.x14-in. screen are described.

For more details circle 145 on  
Enclosed Return Postal Card.

**SEALCOAT FOR ASPHALT:** A new application bulletin describing the use of Vynatex 23 colored sealcoat for asphalt pavement is available from Maintenance, Inc., Wooster, Ohio.

The product is claimed to guard asphalt surfaces against drying action of the sun, oxidation and freeze damage. Directions for preparation of the surface, data on proper application, and suggestions for altering pavement surface textures to meet usage requirements are included in the contents of the bulletin.

For more details circle 146 on  
Enclosed Return Postal Card.

**PORTABLE SEISMIC TIMER:** A bulletin with complete information and details about the Model R-117 Seismic Timer for subsurface exploration is available from Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

No previous knowledge of seismology is required to operate the device, or to interpret the results. According to the manufacturer, it can eliminate or reduce test-hole drilling in foundation investigations.

For more details circle 147 on  
Enclosed Return Postal Card.



## With The Manufacturers



**ALLIS-CHALMERS MFG. CO.:** Engine production has started in a new 515,000 sq. ft. Manufacturing facility recently completed in Harvey, Ill.

The new plant has four semi-automatic assembly lines which are capable of producing more than 130 different variations of four and six

cylinder diesel, gasoline, butane and gas engines. A fifth line is manually controlled and from it flow engine driven electric sets, power units, marine engines, and special industrial engines. In line with a quality control program is an area for testing engines as they come off the line.

**CIMA:** President A. J. Lichtinger, of Construction Industry Manufacturers Association, announces the following appointments: R. B. Bradley, vice-president, IH, Construction Equipment Div., has been appointed director of the International Road Federation, replacing Gail Spain, of Caterpillar, retired; E. C. Chapman, manager, sales development department, Caterpillar Tractor Co., will serve on the Space Allocation Committee for the 1963 Construction Equipment Exposition and Road show, replacing L. L. Morgan; E. B. English, defense products department, Caterpillar Tractor, appointed the CIMA Government Relation Committee to replace W. K. Cox; Harold McKeever, editor of World Construction magazine (eastern hemisphere), and Roads & Streets magazine (U.S.), is a new member of the 1963 Exposition publicity and public relation committee, representing the Construction Writers Association, of which he is president; J. F. Catalane, general sales manager, Construction & Mining Division, Harnischfeger Corp., replaces F. Salditt of P&H, on the CIMA-AGC Joint Committee.

**HYSTER Co.:** Philip S. Hill has climaxed a 28-year career with the company by being appointed President of the firm.

Mr. Hill had been executive vice-president of the Hyster Co. since 1956. He is prominent in the field of heavy machinery and material handling industries, and is currently serving his second term as president of the Industrial Truck Association.

**HUBER-WARCO Co.:** At a September board of directors meeting, Mr. Edward L. Smith was elected Chairman of the Board of Directors and Chief Executive of Huber-Warco, a manufacturer of road graders, road rollers and related equipment.

Mr. Smith will concentrate his work on new product research and development towards an accelerated program emphasizing quality of product and service.

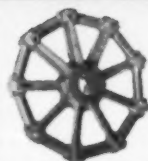
**FWD CORP.:** The board of directors of FWD have appointed M. E. Ash as Chairman of the Board and Chief Executive Officer. Succeeding Mr. Ash as President is L. A. DePolis, who was also elected a member of the board.

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Anyone in your office can operate this flexible, time and error-saving system.

Markers are mounted magnetically, so entire board can be re-arranged in just minutes.

Complete system includes boards, marking tape, tape writing machine, over 500 clear plastic magnetic markers, many other convenient features.

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Baltimore 18, Maryland

\*PAT. PENDING

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**Swap the loader bucket for a crane**, using same lift arms, and you are quickly equipped to handle another type of work.



**Handle bulky objects** or palletized materials with easily interchanged fork lift.

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**Power steering** enables your operator to steer with one hand, freeing the other to operate equipment controls. Pivot turning allows operation in confined quarters. These features, plus Fast Reverser, help produce more cycles per hour.

**Cut job costs still more** with fuel-saving Multi-Range power. Heavy-duty gasoline or Diesel engines go all out to move heavy loads, yet loaf on the lighter tasks to save you money.

**Stretch the number of jobs** you can do per day by switching to the hustling International 460. See your IH dealer for details.

\*Maximum engine horsepower at standard conditions



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**ARIZONA**

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**Malpais**

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For drilling hard, abrasive ground the Timken carbide insert bit gives you greatest economy. In softer ground, the low-cost Timken all steel multi-use bits having a shoulder drive can be used to best advantage. When harder and more abrasive rock is encountered, simply switch to Timken carbide insert bits. They fit the same drill steel. Let our rock bit experts help you select the right Timken bit for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

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removable rock bits

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